A REVIEW OF THE GENUS *DISTICTIS* (BIGNONIACEAE)[1,2]

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Abstract

Distictis Mart. ex Meisn. is a genus of 11 species in the tribe Bignonieae. All the species are lianas and can be recognized by their ribbed hexangular branchlets without interpetiolar glandular fields; bifoliolate leaves with a trifid (or occasionally additionally branched) terminal tendril; terminal inflorescence; usually glandular, campanulate, more or less truncate calyces; more or less straight, tubular-infundibular or tubular-campanulate corollas that are white, purple, orange, or red; usually elliptic, non-echinate capsules with both ends pointed, and often with both valves convex; and usually bialate seeds, with the body brown and ridged and often papillose or pubescent, and the wings usually well demarcated from the seed body and membranous-hyaline. Relationships with similar genera are discussed, and a key to the species of *Distictis*, species descriptions, and species distribution maps are provided. The relationships of the species are also discussed, and a new combination, *D. frutescens* (DC.) A. Pool, is proposed. A neotype is designated for *D. granulosa* Bureau & K. Schum., and lectotypes are designated for *Bignonia rigescens* Jacq., *Pithecoctenium buccinatorium* DC., *P. buccinatorium* var. *subinclusum* DC., *P. buccinatorium* var. *exsertum* DC., *P. cinereum* DC., and *P. uleanum* Kraenzl. *Pithecoctenium stipulare* Mart. ex DC. and *D. stipularis* Mart. ex Glaz. are presented as new synonyms of *D. frutescens*, *P. cinereum* var. *parviflorum* Hochr. is presented as a new synonym of *D. laxiflora* (DC.) Greenm., and *P. scabriusculum* var. *macranthum* Bureau & K. Schum. is presented as a new synonym of *D. scabriuscula* (Mart. ex DC.) A. H. Gentry.

Key words: Bignoniaceae, *Distictis*, Neotropical, Pithecocteniinae.

Distictis Mart. ex Meisn. is a Neotropical genus of 11 species in the tribe Bignonieae, which can generally be recognized by the combination of a number of vegetative, floral, and fruiting characters. As are most members of the tribe Bignonieae, *Distictis* is a genus of lianas that has compound leaves with the terminal leaflet modified into a tendril, bilocular ovaries, and fruits that dehisce parallel to the septum (Gentry, 1980). *Distictis* has branchlets hexangular and ribbed, the ribs often detaching with age, no interpetiolar glandular fields, and often foliaceous pseudostipules. The leaves are bifoliolate with a terminal 3(to 5)-fid tendril.

The inflorescence is a terminal raceme or panicle, with or without conspicuous bracteoles, usually with few to several flowers (numerous in *Distictis pulverulenta* (Sandwith) A. H. Gentry). The calyces are campanulate, pubescent, more or less apically truncate and denticulate, and usually have distinct glandular fields. Most species of *Distictis* have flowers with a weakly zygomorphic corolla that is tubular-infundibular, or tubular-campanulate from a cylindric base, and externally pubescent, with the tube internally glabrous (excluding trichomes at level of insertion of stamens), all four stamens and the stigma included in the corolla, and a pubescent ovary sitting on a large pulvinate nectar disc. Four species (*D. frutescens* (DC.) A. Pool, *D. granulosa* Bureau & K. Schum., *D. laxiflora* (DC.) Greenm., *D. scabriuscula* (Mart. ex DC.) A. H. Gentry) have corollas with purple lobes and usually yellow throats, and four (*D. gnaphalantha* (A. Rich.) Greenm., *D. lactiflora* (Vahl) DC., *D. occidentalis* A. H. Gentry, *D. steyermarkii* A. H. Gentry) have corollas white or white with yellow throats. Two species (*D. buccinatoria* (DC.) A. H. Gentry and *D. staminea* (Lam.) A. H. Gentry) have red or orange corollas and differ from the other species in the genus in having subexserted to exserted stamens and stigma. *Distictis staminea* also differs from the other species in having a markedly bilabiate corolla, and both *D. staminea* and *D. lactiflora* are unusual in the genus in having ovaries that are strongly lepidote with few, if any, trichomes present. *Distictis pulverulenta* differs from the other species of *Distictis* in having dark red- or brown-purple corollas and calyces and the inner surface of the corolla tube densely pubescent and lepidote.

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The capsules of *Distictis* are somewhat more variable than the flowers. They are elliptic in shape and more or less pointed at each end. Both valves are convex or slightly compressed (*D. buccinatoria*) to strongly compressed (*D. scabriuscula*), except for *D. pulverulenta*, which has one valve convex and the other concave, resulting in a curved fruit. The valves are externally pubescent in the South American species but glabrous or nearly so in those from Central America and the West Indies. The seeds are bialate with the body brown and ridged and either puberulent or papillose in most of the species. The wings are generally well demarcated from the seed body, large, membranous and hyaline, except in *D. occidentalis* and *D. pulverulenta*. The seeds of *D. occidentalis* have a more or less corky body and greatly reduced and coriaceous wings, and the seeds of *D. pulverulenta* have the wings poorly demarcated from the body and hyaline only at their apices. Mature capsules and seeds were not seen for *D. frutescens*, *D. gnaphalantha*, and *D. staminea*.

All the South American species of *Distictis* (except *D. pulverulenta*) have simple unbranched racemes, corollas with glandular fields at the base of the lobes, and dendritic trichomes present on petioles, petiolules, and/or leaflets and usually on branchlets and inflorescence also.

By and large, the genus holds together very well. Species that vary from the norm do so in a manner that fits well-established patterns in the Bignoniaceae (as discussed in the Reproductive Biology section of this paper) and are closely paired to another species that fits the typical mold. *Distictis pulverulenta* is the one exception. *Distictis pulverulenta* was originally described in *Distictella* Kuntze by Sandwith (1938) and transferred by Gentry (1976) to *Distictis* based on its hexangular, ribbed branchlets and straight, chartaceous to subcoriaceous, purple corollas, all of which contrast with *Distictella*, which has terete branchlets and curved, coriaceous, white corollas. However, *Distictis pulverulenta* is an oddity in the genus *Distictis* based on several vegetative, floral, and fruiting characteristics that are common in *Distictella* but otherwise unknown in *Distictis*: the many-flowered, compoundly branched panicle, the pubescent and lepidote inner surface of the corolla tube, and the curved fruits. In addition, the pubescence of the undersurface of the leaves is nearly identical to that of an unpublished species of *Distictella* and the seeds are very similar to those of *Distictella elongata* (Vahl) Urb., with wings that are poorly demarcated from the seed body, yellow and hyaline at the tips, and brown and opaque at the base, and with the same irregular ridges and papillae as found on the body. The generic placement of *Distictis pulverulenta* is uncertain, but, pending further study, it is here retained in *Distictis* following Gentry (1976, 1982b).

HISTORY

Meisner established the genus *Distictis* in 1840, crediting Martius with the genus name. He made no new combinations but referred to Vahl's (1794) description and plate of *Bignonia lactiflora* Vahl (= *D. lactiflora*) and Jacquin's (1797) description and plate of *B. rigescens* Jacq. (= *D. lactiflora*). Meisner's (1840) important key characteristics for *Distictis* included seeds more than uniseriate, with membranous wings, calyx simple and truncate, and capsule non-echinate.

A. P. de Candolle (1845) made the combinations in *Distictis* alluded to by Meisner; added *D. arthrerion* (Mart.) DC. (= *Arrabidaea arthrerion* (Mart.) Bureau ex K. Schum.; Schumann, 1894); published the new species *Pithecoctenium frutescens* DC. and *P. stipulare* Mart. ex DC. (= *D. frutescens*), *P. buccinatorium* DC., including two varieties (= *D. buccinatoria*), *P. laxiflorum* DC. and *P. cinereum* DC. (= *D. laxiflora*), and *P. scabriusculum* Mart. ex DC. (= *D. scabriuscula*); and left *Bignonia staminea* Lam. (= *D. staminea*) in *Bignonia* with a "?", perhaps due to the poor quality of the Burman (1756) plate.

Miers (1863) transferred *Pithecoctenium buccinatorium* to his new genus, *Phaedranthus* Miers, publishing also *Phaedranthus lindleyanus* Miers, *P. exsertus* Miers, *P. cinerascens* nom. nud. (all synonymous with *Distictis buccinatoria*), and *P. extatus* Miers (= *Arrabidaea elegans* (Vell.) A. H. Gentry; Gentry, 1975). The important characteristics Miers (1863) used to separate *Phaedranthus* from *Pithecoctenium* Mart. ex Meisn. were large foliaceous pseudostipules, straight, bright purple corolla, and exserted stamens and style.

Bureau (1864) misapplied the name *Distictis* to what is now referred to as *Distictella* and published the new genus, *Macrodiscus* Bureau (= *Distictis*), and combination *M. rigescens* (Jacq.) Bureau (= *D. lactiflora*). Bureau (1864) distinguished *Macrodiscus* (= *Distictis*) from *Distictis* (= *Distictella*) primarily on fruit characters, the capsule of *Macrodiscus* (= *Distictis*) being glabrous (vs. pubescent) and uncurved (vs. curved with one convex and one concave valve), with a furrow in place of a raised midrib, free replum ends extending beyond the tip of the septum (vs. attached), seeds glabrous (vs. pubescent), with relatively shorter wings, and seed scars on the septum punctiform (vs. linear).

Bentham (1876) included both *Macrodiscus* and *Distictis* sensu Bureau in his concept of the genus *Distictis*, in which he identified three groups: (1)

Distictis arthrerion (= *Arrabidaea arthrerion*), (2) *Distictis mansoana* (DC.) Bureau (= *Distictella mansoana* (DC.) Urb.) and *Distictis elongata* (Vahl) Bureau ex K. Schum. (= *Distictella elongata* (Vahl) Urb.), and (3) *Macrodiscus* group: *Distictis lactiflora*, *Distictis rigescens* (Jacq.) DC. (= *Distictis lactiflora*), and *Bignonia gnaphalantha* A. Rich. (= *Distictis gnaphalantha*), noting the curved versus uncurved capsules in distinguishing between groups 2 and 3.

Baillon (1891), Schumann (1894), and Bureau and Schumann (1896) recognized and carried on Bureau's original misapplication of *Distictis* and *Macrodiscus*. Schumann (1894) separated *Distictis* (as *Macrodiscus*) from *Pithecoctenium*, *Distictella* (as *Distictis*), and other related genera based on floral characters: the membranous to subcoriaceous corolla not curving at a right angle versus coriaceous corolla bent at nearly a right angle. In *Flora Brasiliensis*, Bureau and Schumann (1896) retained *P. scabriusculum* (= *Distictis scabriuscula*) and *P. stipulare* (= *D. frutescens*) in *Pithecoctenium* with notes that they might pertain to another genus, and published the new species, *Distictis granulosa*. Schumann (Bureau & Schumann, 1896) acknowledged the different use of the name *Distictis* by de Candolle versus Bureau and indicated that the latter use was employed in the *Flora Brasiliensis*.

Greenman (1898) made the combination *Distictis gnaphalantha* (as suggested by Bentham, 1876), transferred *Pithecoctenium laxiflorum* to *Distictis* (= *D. laxiflora*) based on its fruiting characteristics, and transferred *P. cinereum* to *Distictis* (= *D. laxiflora*) based on its similarities to *D. laxiflora* and *D. gnaphalantha*.

Urban (1908) published the new genus *Wunschmannia* Urb., based on *Bignonia staminea* (= *Distictis staminea*), and observed its affinity with *Macrodiscus* (= *Distictis*) and, in particular, *M. lactiflorus* (Vahl) Bureau ex K. Schum. (= *D. lactiflora*), noting that it differed most importantly in its clearly bilabiate corolla and exserted stamens (Urban, 1908). Urban (1916a) recognized Bureau's misapplication of the genus name *Distictis* and transferred many of the names published in *Distictis* post Bureau to *Distictella*.

Sprague and Sandwith (1932b) discussed the close relationship that exists between *Pithecoctenium stipulare* (= *Distictis frutescens*), *P. scabriusculum* (= *D. scabriuscula*), and *D. granulosa*, which they transferred to *Pithecoctenium*, and enumerated the differences between *P. stipulare* (= *D. frutescens*) and *P. granulosum* (Bureau & K. Schum.) Sprague & Sandwith (= *D. granulosa*), which provided helpful insights in the preparation of this paper.

Pichon (1945) established the genus *Anomoctenium* Pichon based on *Pithecoctenium stipulare* (= *Distictis frutescens*), separating it from *Pithecoctenium* based on its large, foliaceous pseudostipules and the pollen, which he found to be esulcate and finely reticulate, but with gaps in the reticulation.

Sandwith (1962) selected *Distictis lactiflora* as the lectotype of the genus *Distictis*. Sandwith (1965) expanded the concept of *Anomoctenium* to include *Pithecoctenium granulosum* (= *D. granulosa*) and *P. scabriusculum* (= *D. scabriuscula*). He examined the pollen of *A. stipulare* (Mart. ex DC.) Pichon (= *D. frutescens*) but did not find the areas void of reticulation described by both Urban (1916b) and Pichon (1945) and, in comparing it to the pollen of *P. echinatum* (Jacq.) Baill. (= *P. crucigerum* (L.) A. H. Gentry) and *Distictella mansoana*, found all three to be "essentially similar, spherical, unfurrowed and continuously reticulate over the exine" (Sandwith, 1965: 412). Sandwith (1965) described his expanded version of *Anomoctenium* as having dendritic trichomes on all parts, branchlets more or less hexangular, with detachable ribs, purplish corollas with glandular fields externally at the base of the lobes, capsules pubescent with both valves convex and the apex beaked-acuminate, and seeds in two rows, more narrowly transverse-oblong than those of *Pithecoctenium* with a brown, rough and ridged body and hyaline-membranous wings of darker color than those of *Pithecoctenium*. He also compared *Anomoctenium* to *Pithecoctenium*, *Distictella*, and *Amphilophium* Kunth and suggested that *Anomoctenium* should join these three genera in the subtribe Pithecocteniinae of Melchior (1927).

Gentry (1973) placed *Phaedranthus* in synonymy with *Distictis* based on the floral and vegetative similarity of *P. buccinatorius* (DC.) Miers and *D. laxiflora* and, supported by their history of successful hybridization, made the new combination, *D. buccinatoria*.

Gentry (1974a) published a synopsis of the genus *Distictis*, recognizing nine species. In addition to accepting the previously published combinations *D. lactiflora*, *D. gnaphalantha*, *D. laxiflora*, and *D. buccinatoria*, he placed *Wunschmannia* and *Anomoctenium* in synonymy, made three species-level transfers into *Distictis*, and published one new species. These are discussed below. Gentry's (1974a) synonymy, both at the genus and the species levels, has been followed in this paper.

Urban (1908) separated *Wunschmannia* from *Distictis* (as *Macrodiscus*) based on its bilabiate corolla and exserted stamens. Gentry (1974a) noted that the similarities between *Wunschmannia* and *Distictis*, hexangular, ribbed branchlets, leaf form, terminal inflorescence, subfoliaceous pseudostipules, truncate, campanulate calyces, sometimes with glandular fields, and strongly pubescent corollas, outweighed their differences, particularly as his expanded concept of *Distictis* included *D. buccinatoria*, a species with subexserted to exserted stamens. He therefore placed *Wunschmannia* in synonymy with *Distictis* and transferred *W. staminea* (Lam.) Urb. to *Distictis*.

When Sandwith (1965) revised *Anomoctenium* to include *Pithecoctenium granulosum* and *P. scabriusculum*, he compared his new concept of *Anomoctenium* with *Pithecoctenium* and *Distictella* but failed to include *Distictis* in his discussion. When Gentry (1974a) contrasted *Distictis* with Sandwith's interpretation of *Anomoctenium*, he found that the two differed only in *Anomoctenium* possessing dendritic trichomes and corollas with glandular fields. In addition, Gentry (1974a) found the two genera to have a number of characters in common: usually trifid (to several-branched) tendrils, foliaceous pseudostipules, terminal inflorescences, often with leaf-like bracteoles, and very similar corollas, calyces, and pollen. He therefore placed *Anomoctenium* in synonymy with *Distictis*, transferred *A. stipulare* (= *D. frutescens*) and *P. scabriusculum* to *Distictis*, and recognized *A. granulosum* (Bureau & K. Schum.) Sandwith as *D. granulosa*. A new species belonging to the *Anomoctenium* group was published as *D. steyermarkii*.

Gentry (1976) discussed the similarities and differences between *Distictis* and *Distictella* as first recognized by Bureau (1864), modified by Schumann (1894), and, finally, in light of new species described in or transferred to both genera post Bureau and Schumann. Bureau (1864) was the first to recognize *Distictis* (as *Macrodiscus*) and *Distictella* (as *Distictis*) as two closely related genera, distinguished primarily by fruiting characters as described above. Bentham (1876) treated both within the same genus, but as separate groups, one with curved fruits and the other without. Schumann (1894) separated *Distictis* (as *Macrodiscus*) from *Pithecoctenium*, *Distictella* (as *Distictis*), and other related genera based on floral characters: the membranous to subcoriaceous corolla not curving at a right angle versus coriaceous corolla bent at nearly a right angle. De Candolle (1845) described the branchlets of *Distictis* as subangulate and striate, while Sprague and Sandwith (1932b), Schumann (1894, as *Distictis*), and Melchior (1927) described the branchlets of *Distictella* as terete without striation, or without angles with detachable ribs. Gentry (1976) outlined the generic differences described by Bureau (1864) and Schumann (1894) and found that when species described or transferred to *Distictis* post-Bureau (1864) were examined, the fruit differences did not correspond well with the vegetative and floral characteristics. For example, *Distictis granulosa*, *D. scabriuscula*, and *D. steyermarkii* all have pubescent capsule and seeds (characters of *Distictella*) but have the flowers and branchlets of *Distictis*. Likewise, *Distictella monophylla* Sandwith and *D. obovata* Sandwith have flowers and twigs of *Distictella* but uncurved fruits and glabrous seeds, characteristics previously associated with *Distictis*. Gentry concluded that, "In general the characters of the fruit elucidated by Bureau lack taxonomic significance at the generic level" (Gentry, 1976: 78), and transferred *Distictella pulverulenta* Sandwith (which has a pubescent, curved fruit with seeds with poorly demarcated wings) to *Distictis* based on its hexangular, ribbed stems and straight, chartaceous to subcoriaceous and purple corollas.

In 1992, Gentry published another new species in the genus *Distictis*, *D. occidentalis*. It is a member of the *Anomoctenium* group and, in most earlier collections, had been identified as *D. granulosa*.

ANATOMY

Santos (1995) studied 31 genera of Bignonieae and divided them into four groups based on the type of cambial variant present. Two species of *Distictis*, *D. granulosa* and *D. occidentalis*, were included in her study. A third species, *D. pulverulenta*, is discussed, but the MO sheet of the voucher cited (*G. dos Santos et al. 279*) is clearly *D. granulosa*. *Distictis* fits into her "group 2," which is characterized by stems with multiples of four phloem wedges in transverse section. The genera generally thought to be the most closely related to *Distictis*, *Distictella* and *Pithecoctenium* (Sandwith, 1965; Gentry, 1976; Gentry & Tomb, 1979), belong to Santos' "group 4," which has stems with discontinuous phloem wedges intersected with xylem and parenchyma (Santos, 1995). *Amphilophium*, another genus that is considered closely related by both Sandwith (1965) and Gentry (1974a), is included with *Distictis*, and a large number of other genera, in Santos' "group 2."

PALYNOLOGY

Gentry and Tomb (1979) included *Distictis buccinatoria* and *D. occidentalis* (reported as *D. granulosa*) in their SEM survey of pollen types in the Bignoniaceae. From this, they concluded that *Distictis* has inaperturate, coarse-reticulate pollen (Gentry & Tomb, 1979). This is supported by the earlier light microscopic studies of Urban (1916b) and Sandwith (1965). Unfortunately, Urban (1916b) did not cite species or vouchers examined. However, it appears that species of *Distictis* as currently circumscribed were included in four of the genera he surveyed. He included *D. lactiflora* and *D. gnaphalantha* in his discussion of *Distictis* and described the pollen of this genus as spherical, esulcate (= inaperturate) with large spaces between the meshwork of the reticulation (= coarse-reticulate). *Wunschmannia* (= *D. staminea*) was described as having spherical and esulcate pollen with a large-mesh reticulation. *Distictis laxiflorum* (as *Pithecoctenium cinereum*) was included in his discussion of *Pithecoctenium*, and *Pithecoctenium* was described as having spherical, esulcate pollen with moderately large-mesh reticulation, except for *P. stipulare* (= *D. frutescens*), which was said to have moderate-sized gaps in the network of the exine. Pichon (1945) found these same gaps, but Sandwith (1965) found the pollen of this species to be spherical, unfurrowed, and continuously reticulate. Urban (1916b) described the pollen of *Phaedranthus* (= *D. buccinatoria*) as spherical and esulcate, with large reticulation and the walls of the mesh having outgrowths. These same outgrowths were described for *Distictella broadwayana* Urb. (= *Distictella racemosa* (Bureau & K. Schum.) Urb.), and Sandwith (1965: 412) suggested that Urban "was confusing exaggerated bulging sinuosities of the walls with outgrowths."

It seems probable that all members of the genus *Distictis* as currently circumscribed do have similar pollen: spherical, inaperturate with coarse reticulation. Gentry and Tomb (1979) found this pollen type in a number of other genera, which they suggested could be divided into two natural groups. The one including *Distictis* is characterized by having thick-textured white to purple or red flowers, trifid to multitrifid tendrils, and multiseriate ovules and seeds. The other genera in the group are *Pithecoctenium* and *Distictella*, genera that Sandwith (1965) and Gentry (1976) had previously suggested as closely related. *Amphilophium*, another genus suggested as closely related (Sandwith, 1965; Gentry, 1974a), had pollen of a different type, stephanocolpate (zonocolpate) with coarse reticulation (Gentry & Tomb, 1979), a pollen type shared with *Glaziovia* Benth. & Hook. f., and *Haplolophium* Cham. (including *Urbanolophium* Melch.), all of which are characterized by a frilly outer calyx margin, unique in the family (Gentry & Tomb, 1979).

GENERIC PLACEMENT WITHIN THE TRIBE BIGNONIEAE

Melchior (1927) established the subtribe Pithecocteniinae, which included *Pithecoctenium*, *Distictella*, *Neves-armondia* K. Schum. (= *Pithecoctenium*), *Urbanolophium* (= *Haplolophium*, following Gentry, 1992), *Haplolophium*, *Glaziovia*, and *Amphilophium*. The subtribe was described as having bifoliolate or trifoliolate leaves, tendrils usually trifid (rarely bifid), or additionally forked, and often with disk-like tips; the calyx thickly coriaceous and densely tomentose, with or without defined lobes, the corolla coriaceous, and, except in *Amphilophium*, densely pubescent, often curved at a right angle and sometimes more or less bilabiate; and the capsule oblong-elliptic, flattened, the surface smooth or rough to echinate, and the seed with a membranous wing. *Distictis* was not included in Melchior's concept of the subtribe, perhaps due to its less coriaceous corolla and shape of the capsule valves; the species that would have been considered to be in *Distictis* at that time, *D. lactiflora*, *D. gnaphalantha*, and *D. laxiflora*, all have convex capsule valves that are not at all flattened. However, in other respects *Distictis* does fit the description of Pithecocteniinae. It also shares a number of additional similar features with individual genera within the subtribe. All of the genera have seeds with at least the seed body irregularly ridged or papillose, and most have at least some species with pubescent seed bodies. *Distictis*, *Pithecoctenium*, and *Distictella* all have a similar pollen type (Gentry & Tomb, 1979), and *Distictis* and *Pithecoctenium* both have hexangular, ribbed branchlets, seeds with the wings (in most species) well demarcated from the seed body, and, at least sometimes, many-branched tendrils. *Pithecoctenium* and *Distictella* both differ from *Distictis* in having corollas that are strongly curved and always white. *Distictis*, *Amphilophium*, and most species of *Haplolophium* have branchlets that are acutely hexangular and share the same type of cambial variant (Santos, 1995). In addition, many of the species in all three genera have at least some branched trichomes. Both *Amphilophium* and *Haplolophium* differ from *Distictis* in pollen type (Gentry & Tomb, 1979) and in their calyces, which have an expanded and frilly margin, and *Amphilophium* also differs in having pseudo-cleistogamous corollas. The close relationship of *Distictis* with members of the Pithecocteniinae was suggested by Sandwith (1965; as *Anomoctenium*), Gentry (1974a, 1976), and Gentry and Tomb (1979).

DISTRIBUTION

Distictis is a Neotropical genus, known from central and southern Mexico, throughout the West Indies, and northern South America to Peru, Bolivia, and Brazil. Two species, *D. buccinatoria* (Fig. 1A) and *D. laxiflora* (Fig. 2A), are found from central to southern Mexico, in rocky areas or deciduous forests above 1000 m, and *D. laxiflora* is also known from northwestern Nicaragua in similar habitats, above 1000 m. Three species are found in the West Indies in dry forest below 1000 m: *D. staminea* (Fig. 1A),

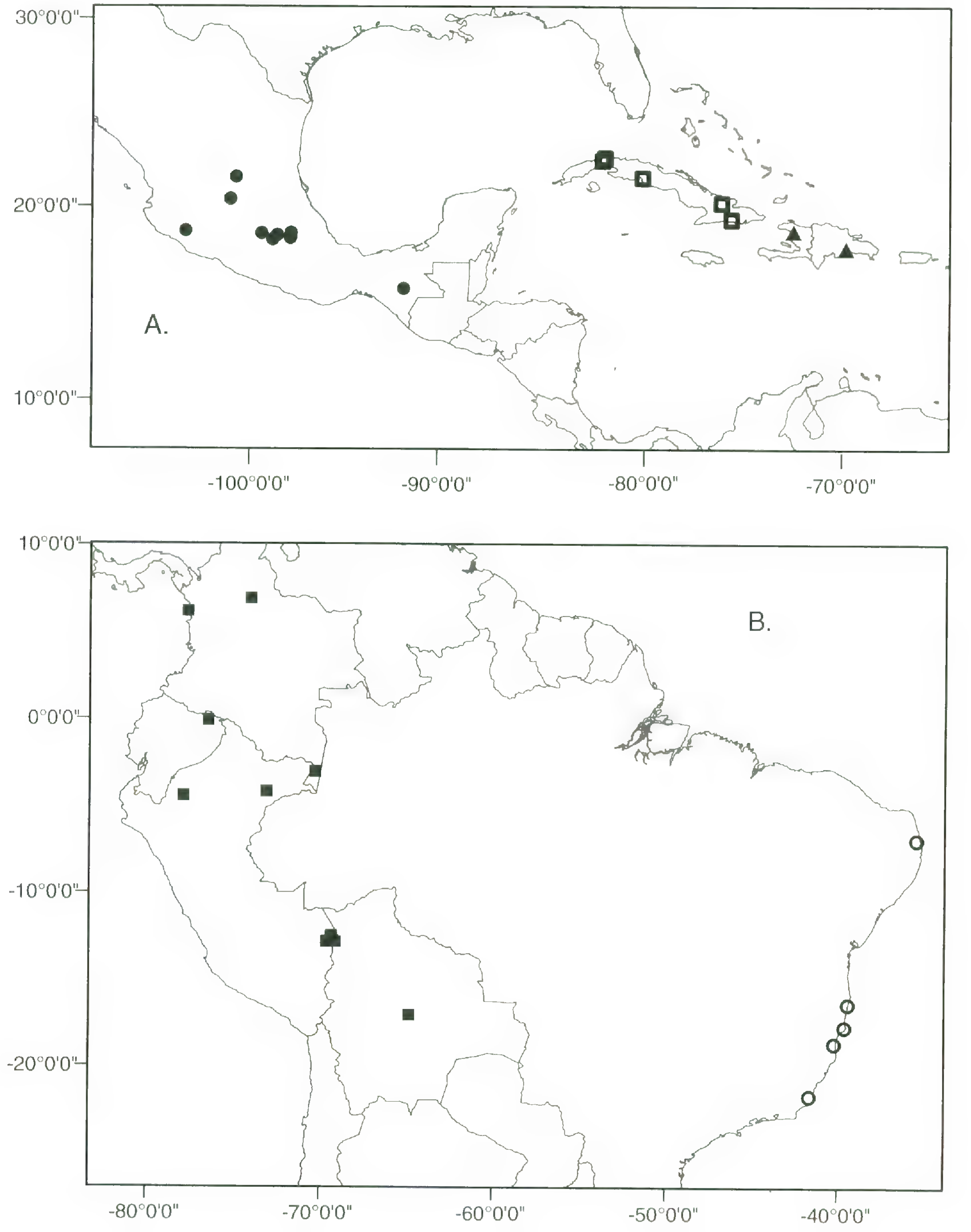

Figure 1. Distribution of selected species of *Distictis*. —A. *Distictis buccinatoria* (DC.) A. H. Gentry (●), *D. gnaphalantha* (A. Rich.) Greenm. (□), and *D. staminea* (Lam.) A. H. Gentry (▲). —B. *Distictis frutescens* (DC.) A. Pool (○) and *D. occidentalis* A. H. Gentry (■).

endemic to Hispaniola; *D. gnaphalantha* (Fig. 1A), endemic to Cuba; and *D. lactiflora* (Fig. 2A), widespread in Cuba, Haiti, Dominican Republic, Puerto Rico, St. Croix, and St. Thomas. The remaining species are South American. One species, *D. steyermarkii* (Fig. 2A), is found along the northern border of Colombia with Venezuela and on the Atlantic coast of Venezuela in very dry, deciduous forests between sea level and 1400 m. Two species, *D. frutescens* (Fig. 1B) and *D. scabriuscula* (Fig. 2B), are

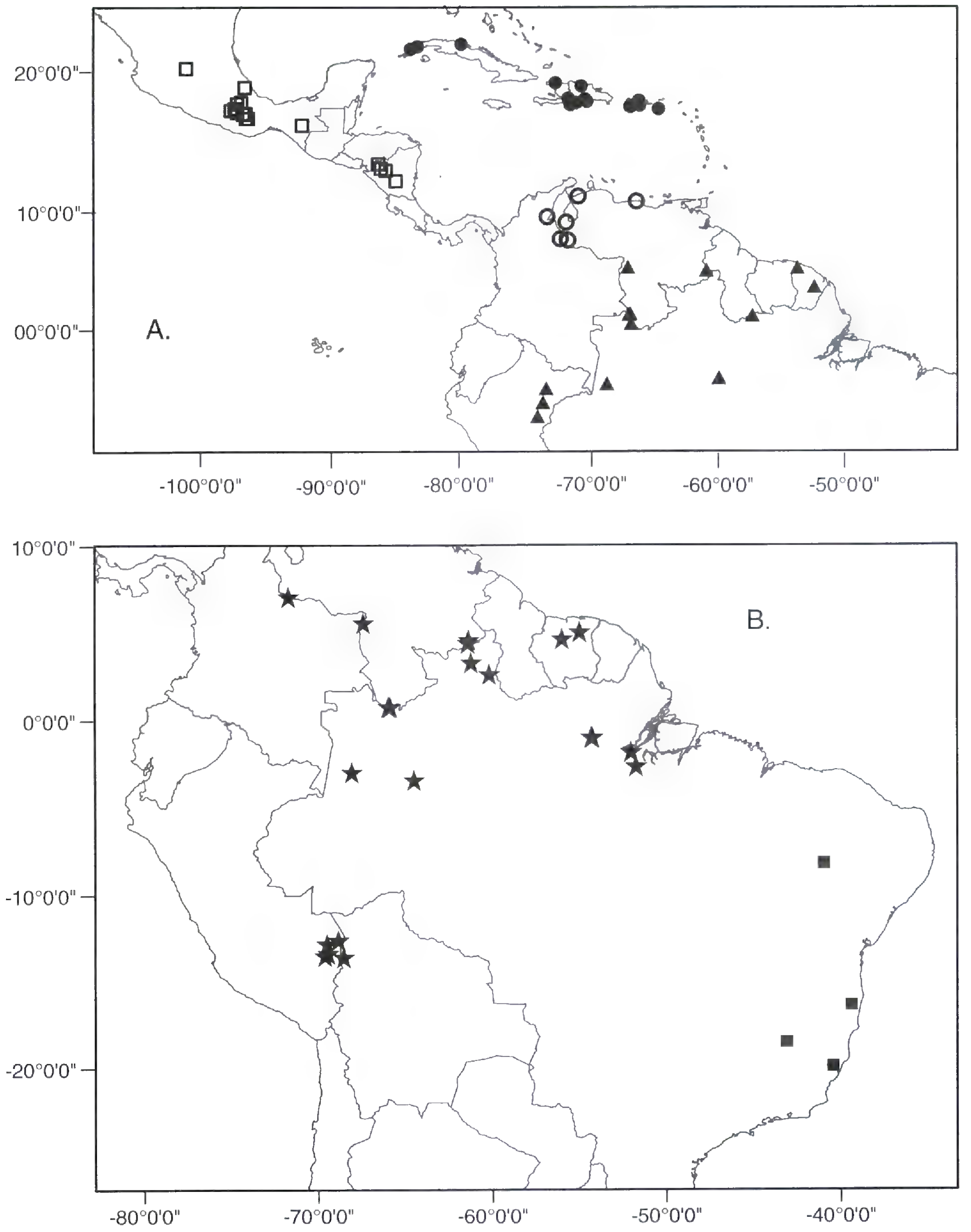

Figure 2. Distribution of selected species of *Distictis*. —A. *Distictis lactiflora* (Vahl) DC. (●), *D. laxiflora* (DC.) Greenm. (□), *D. pulverulenta* (Sandwith) A. H. Gentry (▲), and *D. steyermarkii* A. H. Gentry (○). —B. *Distictis granulosa* Bureau & K. Schum. (★) and *D. scabriuscula* (Mart. ex DC.) A. H. Gentry (■).

endemic to eastern Brazil, both probably growing in wet forest, *D. frutescens* below 100 m and *D. scabriuscula* below 1000 m. *Distictis occidentalis* (Fig. 1B) is the westernmost species of *Distictis* in South America and is found from Colombia (Chocó and Santander) south to Peru (Madre de Dios) and Bolivia (Santa Cruz), usually in seasonally inundated forests or along rivers between 100 and 300 m. *Distictis granulosa* (Fig. 2B) is found in the central Amazon and Guianas as well as southeastern Peru

(Madre de Dios and Puno) in moist to wet forests between 30 and 1200 m. The distribution ranges of *D. granulosa* and *D. occidentalis* overlap at Tambopata, Peru, but *D. occidentalis* is found in swampy areas around lake margins, while *D. granulosa* is found in sandy upland forests (Gentry, 1992). *Distictis pulverulenta* (Fig. 2A) is found in a northern Amazonian arc, stretching from the Guianas west and south through southern Venezuela, southern Colombia, northwestern Brazil, and northeastern Peru, in non-inundated forests on white sand (Gentry, 1979a) between 120 and 900 m.

REPRODUCTIVE BIOLOGY

Gentry (1974b, 1980) recognized 10 major morphological floral types within the Bignoniaceae, each with its own correlating pollination agent(s). Most species of *Distictis* seem to be adapted toward bee pollination (Gentry, 1990). They have coriaceous calyces that are generally pubescent and glandular, corollas that have white to purple lobes and a yellow throat and are moderately thick in texture and pubescent with the base of the tube narrow and more coriaceous, included stamens and style, and a large nectary disc. Several species have additional glandular fields on the outer surface of the corolla tube, directly below the lobes. Flowers of *Distictis* are somewhat intermediate between the *Anemopaegma*-type and *Pithecoctenium*-type flowers described by Gentry (1974b). The *Anemopaegma* type is the most common in the Bignoniaceae. It is characterized by thin membranous corollas with an open mouth and included anthers. There is considerable variation within this group. The flowers may be yellow, white, blue, or purple, often with a contrastingly colored throat. They may be externally pubescent, glabrous, or lepidote. All are conspicuous and produce large quantities of nectar. They are pollinated by large- to medium-sized bees but may also suffer heavily from nectar robbery (Gentry, 1974b). *Pithecoctenium*-type flowers appear to be designed to thwart nectar robbers. They have very thick protective calyces, and corollas that are externally densely pubescent (above the calyx), are very thick (especially at the base), and have an internal sturdy ridge of thickened (perhaps glandular) trichomes at the level of the insertion of stamens that nearly closes the tube (Gentry, 1974b). In addition to the above characteristics, flowers in this group are generally strongly bent or curved below the middle, are white or cream colored, and produce abundant nectar (Gentry, 1974b). Other genera in this group include *Distictella* and *Ceratophytum* Pittier (Gentry, 1974b). The fairly thick, pubescent calyces and corollas of most species of *Distictis* probably help to reduce the number of successful nectar robbers (Gentry, 1974b), and the glands on the calyces (and in some cases corollas) probably attract ants, which provide further protection against nectary robbers and help protect the developing ovary against herbivory (Elias & Gelband, 1975).

Four of the nine species of bee-pollinated *Distictis* have white corollas, while five have corolla lobes that are shades of purple. Of the four white-flowered *Distictis*, *D. lactiflora* and *D. gnaphalantha* are endemic to the West Indies; Gentry (1990) noted that white flowers are common in the Greater Antilles. Gentry (1990) also noted that in *Tabebuia* Gomes ex DC., all of the "core-habitat" species have yellow or magenta flowers, while the habitat specialists have white flowers. *Distictis* seems to follow the same pattern. All of the purple-flowered *Distictis* in South America are found in wet or moist forest, but one of the white-flowered species, *D. occidentalis*, is commonly found in seasonally inundated forests (Gentry, 1992), while the other, *D. steyermarkii*, is found in very dry, deciduous forests.

Distictis staminea and *D. buccinatoria* appear to be hummingbird pollinated (Gentry, 1990). They both have coriaceous calyces, corollas that are orange to red, and subexserted to exserted stamens, and they fit more or less into Gentry's (1974b) *Martinella* type. The *Martinella* type is characterized as having bright red-orange or deep red-violet flowers that produce abundant nectar and are odorless. The corolla is generally rather thick and glabrous outside with an open mouth and a long tube, and the stamens are often exserted or subexserted. The calyx is usually large and membranous and is loose around the base of the corolla tube. Both *D. staminea* and *D. buccinatoria* differ from this standard type in having coriaceous calyces and externally pubescent corolla tubes. *Distictis staminea* also varies from the standard in the corolla being chartaceous and not very long.

Change in pollinators within a genus is rare in the Bignoniaceae. Gentry (1990) reported that only 18% of the Neotropical genera of Bignoniaceae have more than one type of pollen vector and that "such changes appear to be associated with the major genetic reorganization that accompanies generic differentiation" (Gentry, 1990: 125). In fact, both hummingbird-pollinated species of *Distictis* have been treated in separate monotypic genera, *Phaedranthus* and *Wunschmannia*. However, each of the hummingbird-pollinated species of *Distictis* is closely paired with a bee-pollinated species.

Nonfruiting specimens of *Distictis buccinatoria* and *D. laxiflora* are difficult to distinguish, the only reliable characters being the exsertion of the stamens, color of the corolla, and a tendency for the flowers of *D. buccinatoria* to be larger. The horticultural hybrid that exists between the two further supports their inclusion in the same genus.

Vegetatively, *Distictis staminea* is very similar to *D. lactiflora*, the two differing only in the color and symmetry of the corolla, exsertion of the stamens, and foliar pubescence. It is interesting to note that one of the two hummingbird-pollinated species, *D. staminea*, is endemic to Cuba. Gentry (1990) reflected that a switch in pollinators is common in the Greater Antilles.

Gentry (1974b) recognized five different basic patterns in flowering phenology in the Bignoniaceae. Patterns in phenology are often difficult to recognize from a herbarium study, particularly when the geographic range of the species is large and the number of collections relatively few; however, a few patterns are worth noting. In this herbarium study, the months in which individual species were seen to flower varied from two to nine. The one with the greatest range in flowering time (December–July, September) was *Distictis lactiflora*, a species found throughout much of the West Indies. Gentry (1990) noted that steady-state flowering, lacking seasonality, was a common phenomenon in the Greater Antilles. *Distictis gnaphalantha*, endemic to Cuba, appears to have two flowering seasons per year, once during the main dry season (February–May) and again during a secondary dip in rainfall (July). Few specimens of *D. staminea*, endemic to Hispaniola, have been seen by either myself or A. H. Gentry; it is known to flower in January (the driest month), March (moderately wet), and May (the wettest month). *Distictis laxiflora*, from Mexico and Nicaragua, flowers March to August, and *D. buccinatoria*, from Mexico, flowers April to August; both of these flowering times are at the end of the dry season through the peak of the wet season. *Distictis steyermarkii*, from Venezuela and Colombia, flowers in February and March (dry season) and again in August, October, and November (toward the end of wet season). *Distictis frutescens*, from the Atlantic coast of Brazil, flowers August to November (end of dry to wet season) and March (wet season), while *D. scabriuscula*, endemic to central-eastern Brazil, flowers February and March (wet season). Two of the three basically Amazonian species flower probably once per year, *D. granulosa* from July to March (relatively dry to wet season) and *D. occidentalis* from April to July (dry season), with one collection seen in flower in October. The third species, *D. pulverulenta*, seems to have two flowering seasons per year, May to July (wet season) and November through December (wet season).

Most species of *Distictis* appear to be wind dispersed. *Distictis buccinatoria*, *D. granulosa*, *D. lactiflora*, *D. laxiflora*, *D. scabriuscula*, and *D. steyermarkii* have seeds that are clearly bialate; the wings are well demarcated from the seed body, often large, and membranous-hyaline. *Distictis pulverulenta* also has large membranous wings, but they are opaque except at the apices and are not well demarcated from the seed body. *Distictis occidentalis* has seeds with wings greatly reduced and coriaceous and the body somewhat corky, suggesting that it is water dispersed and correlating well with its usual habitat of seasonally inundated forests or growth along rivers. Shifts from wind dispersal to water dispersal within genera of Bignoniaceae are not uncommon (Gentry, 1983), and Gentry (1973: 227) stated "each water-dispersed species is most closely related to and presumably derived from a different wind-dispersed one." For *D. gnaphalantha* and *D. staminea*, I have seen neither seeds nor descriptions of seeds. I have not seen the seeds of *D. frutescens*, but Gomes (1952) described the seeds as small winged and dark brown, suggesting that they might be similar to those of *D. occidentalis*. *Distictis frutescens* is frequently described as growing along rivers.

ECONOMIC USES

Distictis buccinatoria (Mexican Blood Trumpet), *D. laxiflora* (Vanilla Distictis or Vanilla Trumpet Vine), and their horticultural hybrid, *Distictis* cv. 'Rivers' (marketed as "Distictis riversii"), are cultivated throughout the tropical and subtropical areas of the world as ornamentals for their beautiful flowers (Menninger et al., 1970; Bailey et al., 1976). *Distictis laxiflora* has sometimes been confused in the horticultural trade with *D. lactiflora* (Menninger et al., 1970), but following Bailey et al. (1976) plants grown under the latter name are probably *D. laxiflora*.

MATERIALS AND METHODS

All specimens examined by Gentry and as part of this study have been incorporated into the Missouri Botanical Garden database-management system TROPICOS, <http://mobot.mobot.org/W3T/Search/vast.html>, which now contains label information for all *Distictis* specimens housed at MO in addition to those received on loan from AAU, B, BM, BR, C, CAS, CGE, CM, F, FTG, G, GH, GOET, L, M, MICH, NY, S, TEX, U, UPS, US, and W. Specimens determined by this author were selected from this database to generate the index to numbered exsiccatae (Appendix 1) and the distribution maps, the latter with the assistance of Duan Bills. Dots on the maps (Figs. 1, 2) represent a subset of the specimens examined by this author, including specimens with geographic coordinates provided on collection labels and a set of specimens for which the author estimated the geographic coordinates, selected to illustrate the full geographic range for each species.

Wet and dry season designations were made based on Brawer (1991) and the Internet site: <http://www.travel.dk.com/wdr/>.

The term furfuraceous-dendritic trichome is used to describe a very small-branched trichome that Gentry sometimes referred to as thick-stellate (Gentry, 1992). Furfuraceous-dendritic trichomes differ from stellate trichomes in that the arms of the trichome do not radiate from one point, and from other dendritic trichomes in that there are no distinct internodes between the arms of the trichome.

TAXONOMIC TREATMENT

Distictis Mart. ex Meisn., Pl. Vasc. Gen. 1: 300, 2: 208. 1840. TYPE: *Distictis lactiflora* (Vahl) DC. [based on *Bignonia lactiflora* Vahl] (lectotype, designated by Sandwith, 1962: 454).

Phaedranthus Miers, Proc. Roy. Hort. Soc. London 3: 182. 1863, nom. cons. TYPE: *Phaedranthus lindleyanus* Miers.

Macrodiscus Bureau, Monogr. Bignon. 46, t. 11. 1864. TYPE: *Macrodiscus rigescens* (Jacq.) Bureau [based on *Bignonia rigescens* Jacq.].

Wunschmannia Urb., Symb. Antill. 5: 494. 1908. TYPE: *Wunschmannia staminea* (Lam.) Urb. [based on *Bignonia staminea* Lam.].

Anomoctenium Pichon, Bull. Soc. Bot. France 92: 226. 1946. TYPE: *Anomoctenium stipulare* (Mart. ex DC.) Pichon [based on *Pithecoctenium stipulare* Mart. ex DC.].

Lianas, indumentum of simple and/or dendritic trichomes; branchlets hexangular and ribbed, the ribs sometimes detaching with age, without interpetiolar glandular fields; pseudostipules often foliaceous or subfoliaceous, or less often small and bract-like to absent, persistent to caducous. Leaves bifoliolate, frequently with a tendril; tendril terminal, apically 3(rarely 5)-fid, sometimes with tips disk-like. Inflorescence terminal (or terminal and lateral), raceme or panicle; bracts and bracteoles narrow, conspicuous to inconspicuous, persistent or caducous, flowers few to several (numerous in *Distictis pulverulenta*); calyx campanulate, usually with glandular zones externally below the margin, apex ± truncate and denticulate; corolla white to cream, lilac to mauve, magenta to deep red-purple or dark yellow to orange or red, weakly zygomorphic or rarely strongly bilabiate (*D. staminea*), tubular-infundibular or tubular-campanulate from cylindric base, tube straight to slightly arching, externally pubescent, internally usually glabrous except for level at which stamens are inserted (tomentose in *D. pulverulenta*); lobes wide, imbricate, pubescent, sometimes with glandular fields externally at base; stamens 4, inserted at same level in corolla tube, generally included or at least the longer pair subexserted to exserted (*D. staminea* and *D. buccinatoria*), anthers glabrous, dithecal, the thecae straight, divaricate or subparallel, glabrous, staminode present, small, inserted at same level as stamens; disc annular-pulvinate; ovary pubescent (or conspicuously lepidote, *D. lactiflora* and *D. staminea*), ovules several-seriate in each locule. Fruit a capsule, elliptic or elliptic-oblong, generally pointed at both ends, woody, non-echinate, both valves convex or one valve convex and the other concave resulting in a curved fruit (*D. pulverulenta*) or both slightly compressed (*D. buccinatoria*) to strongly compressed (*D. scabriuscula*), septum parallel to valves, without raised edges; seeds in 2 rows, body brown with irregular ridges, usually somewhat papillose or puberulose, bialate, wings usually well demarcated from the body, large, membranous and hyaline, rarely poorly demarcated (*D. pulverulenta*) or poorly demarcated, greatly reduced, coriaceous and opaque (*D. occidentalis*).

Phaedranthus Miers is placed in synonymy of *Distictis* based on the many vegetative and floral similarities that its single species shares with *D. laxiflora*, from which it is difficult to distinguish without fruit, the similarity of its pollen type to that of *D. occidentalis* (Gentry & Tomb, 1979), the similarities of its fruit and seeds to that of many species of *Distictis*, and its successful horticultural hybridization with *D. laxiflora* (Gentry, 1973). The placement of *Phaedranthus* in synonymy of *Distictis* follows Gentry (1973, 1974a). *Phaedranthus* is conserved against the rejected name *Sererea* Raf. (McNeill et al., 2006) following Sandwith's (1955) proposal. *Sererea* was published in 1838 (Rafinesque, 1838) and would have priority over *Distictis* (Meisner, 1840) if the two were considered synonymous. When Rafinesque (1838) published his new monotypic genus, *Sererea*, he provided a brief genus description, followed by the new combination, *S. heterophylla* Raf., based on *Bignonia heterophylla* Willd. (published as a superfluous name for *B. kerere* Aubl.). Below this species name, he cited the original Aublet (1775) plate of *B. kerere* Aubl. (as *B. "cherere"*) and plate 1301 in Lindley (1830). A short species description was also included. The Lindley (1830) plate that Rafinesque (1838) cited, while labeled *B. "cherere"* Aubl., is not this species and is very different from the Aublet (1775) plate and description. The Lindley plate depicts a plant with large foliaceous pseudostipules, flowers in a panicle, the corolla red above the base, and slightly exserted stamens. The Aublet plate illustrates a plant with scale-like pseudostipules, flowers in a small raceme, the corolla (in description) yellow, and the stamens and stigma well included. Rafinesque's description of *Sererea* is clearly based on Lindley's plate and description. Miers (1863) published the new genus *Phaedranthus*, selecting *P. lindleyanus* Miers as the type of the genus. The latter was published without description but validated by referring to the Lindley (1830) publication, and the type was apparently *W. Lambert s.n.*, "in hort. Soc. Hort. Cult. (anno 1834)." Sandwith (1955) believed *Sererea* and *Phaedranthus* to be synonyms because the descriptions of both were based on the plate and description of *B. "cherere"* sensu Lindley, and he believed that Rafinesque's choice of type species *S. heterophylla* based on *B. heterophylla* Willd. "auct. *B. cherere* Aubl." should be treated as an error, taken by inference from Lindley. In other words, Sandwith believed that Lindley's plate should be treated as the type of *Sererea*. However, following Article 10.4 of the *International Code of Botanical Nomenclature* (McNeill et al., 2006), a specimen or illustration that is not the type of a name of an included species can be made the type of the name of a genus only through the act of conservation. As this was not done for *Sererea*, the type of the genus remains the only species included by Rafinesque, *S. heterophylla* (nom. superfl. for *B. kerere*), a species now treated in *Mansoa* as *M. kerere* (Aubl.) A. H. Gentry (Gentry, 1979b), and *Sererea* therefore is a synonym of *Mansoa* and not synonymous with *Distictis* (including *Phaedranthus*).

Macrodiscus Bureau is placed in synonymy of *Distictis* based on the synonymy of its type, *M. rigescens* (Jacq.) Bureau, with the lectotype of *Distictis*, *D. lactiflora* (Vahl) DC.

The monotypic genus *Wunschmannia* Urb. is placed in synonymy of *Distictis* based on its hexangular, strongly ribbed branchlets, subfoliaceous pseudostipules, bifoliate leaves with a terminal, trifid tendril, terminal inflorescence, denticulate calyx, and strongly pubescent corolla, all characteristics common in *Distictis*. Urban's (1916b) description of the pollen of *W. staminea* also closely matches Gentry and Tomb's (1979) description of pollen of *D. buccinatoria* and *D. occidentalis*. The distinguishing characteristics of *W. staminea*, its strongly bilabiate, red corolla and long-exserted stamens, are probably associated with a switch of pollinators from bee to hummingbird. Red corollas and exserted stamens are also present in *D. buccinatoria*.

Anomoctenium Pichon was described by Pichon (1945) with one species, *A. stipulare* (Mart. ex DC.) Pichon, and expanded by Sandwith (1965) to include *A. granulosum* and *Pithecoctenium scabriusculum*. *Anomoctenium* species differs from other *Distictis* only in the presence of dendritic trichomes on most parts and the glandular fields found externally at the base of the corolla lobes. Species of *Anomoctenium* are similar to most species of *Distictis* in having strongly ribbed, hexangular branchlets; bifoliate leaves with a terminal, trifid tendril; denticulate to truncate calyx with external glandular fields; pubescent corolla; elliptic, non-echinate capsules with both valves convex (not seen for *A. stipulare*); and seeds with the wings well demarcated and membranous-hyaline (not seen for *A. stipulare*). Sandwith's (1965) description of the pollen of *A. stipulare* also closely matches Gentry and Tomb's (1979) description of pollen of *D. buccinatoria* and *D. occidentalis*. The similarities of *Anomoctenium* and *Distictis* outweigh the differences, and I agree with Gentry (1974a) in placing *Anomoctenium* in synonymy with *Distictis*.

Key to Species of *Distictis*

1. Dendritic trichomes present on petioles, petiolules, and/or leaflets, and usually also on branchlets and inflorescence (often mixed with simple trichomes in *D. steyermarkii*); linear glandular fields present externally at base of corolla lobes; inflorescence a raceme.

2. Simple trichomes present at least on adaxial surface of leaflets, longest dendritic trichomes (rarely 0.3–)0.7–2 mm long, furfuraceous-dendritic trichomes absent from vegetative parts; leaflets with bases usually clearly cordate (rarely subcordate); corolla lobes white . . . . 11. *D. steyermarkii*

2′. Simple trichomes absent, longest dendritic trichomes rarely to 0.3 mm long, furfuraceous-dendritic trichomes present on young branchlets, petioles, and petiolules; leaflet bases various, sometimes subcordate; corolla lobes white (*D. occidentalis*) or various shades of purple.

3. Pseudostipules 6–20 × 7–20 mm, persistent; leaflet tertiary venation reticulate, not parallel or ladder-like; bracteoles 13–22 × 2–8 mm; calyx glandular fields short and broad; corolla lobes lilac to mauve . . . . 2. *D. frutescens*

3′. Pseudostipules absent, or 2–4 × 0.5–4 mm and caducous; leaflet tertiary venation generally parallel and ladder-like; bracteoles 1.5–12 × 0.5–2 mm; calyx glandular fields narrow and oblong or, if short and broad, then corolla lobes white.

4. Corolla lobes white; seeds with wings reduced, coriaceous and opaque; calyx glandular fields short and broad . . . . 7. *D. occidentalis*

4′. Corolla lobes purple, lavender, or purple-red; seeds with well-developed wings, membranous and hyaline; calyx glandular fields narrow and oblong.

5. Leaflets subcoriaceous to coriaceous with midrib and lateral veins impressed on the adaxial surface; bracteoles usually persistent, 1.5–2 × 1 mm; calyx with strongly appressed

furfuraceous-dendritic trichomes; throughout northern South America, including Peru and Bolivia, and in Brazil, in areas bordering the Amazon and its tributaries . . . . 4. *D. granulosa*

5′. Leaflets membranous to chartaceous, midrib and lateral veins usually flat on adaxial surface; bracteoles caducous, 6–11 × 0.5–1 mm; calyx with at least some trichomes with well-developed rachis and these trichomes spreading; restricted to central-eastern Brazil . . . . . 9. *D. scabriuscula*

1′. Dendritic trichomes absent; corollas without glandular fields; inflorescence a panicle or raceme.

6. Corolla strongly bilabiate, lower lip reflexed with 3 equal lobes, upper lip erect and bilobate; longer pair of stamens far exserted; ovary densely lepidote with scattered trichomes at base; endemic to Hispaniola . . . . 10. *D. staminea*

6′. Corolla weakly zygomorphic; longer pair of stamens included, or if exserted, then ovary densely sericeous; Mexico, Central America, West Indies, and South America.

7. Corolla tube internally tomentose and lepidote; corolla lobes dark red- or brown-purple; capsule curved, with one valve convex and the other concave; seeds with wings poorly demarcated from seed body; leaflets with abaxial surface drying greenish gray, usually densely furfuraceous-tomentose with the main veins glabrescent, occasionally the surface glabrescent, with large glands in conspicuous clusters in lower lateral vein axils; northern South America . . . . 8. *D. pulverulenta*

7′. Corolla tube internally glabrous, excluding trichomes at level of insertion of stamens; corolla lobes red, orange-red, white, lavender, or magenta; capsules not curved, both surfaces convex to slightly compressed; seeds with wings well demarcated from seed body (not known for *D. gnaphalantha*); leaflets with abaxial surface drying yellow-green to dark green, golden green, or brownish green, glabrous or, if pubescent, pilose, villous, or puberulent, with trichomes overall or restricted to veins or vein axils, large glands scattered, often more dense in lower lateral veins axils, but not forming conspicuous clusters; Mexico, Central America, and West Indies.

8. Corolla lobes red or orange-red, longer pair of stamens subexserted to exserted; capsules oblong-elliptic, 13–15 × 4–5.5 cm, apex acute with tip rounded and retuse . . . . 1. *D. buccinatoria*

8′. Corolla lobes white, white with pink or lavender flush, magenta, or lavender, stamens well included; capsule elliptic or elliptic-fusiform, 3–10.5 × 1.5–3.5 cm, apex acute to acuminate.

9. Leaflets subcoriaceous to coriaceous with veins conspicuously prominent adaxially, glabrous abaxially; ovaries densely lepidote, or lepidote and puberulent, style glabrous . . . . 5. *D. lactiflora*

9′. Leaflets membranous with veins flat or impressed adaxially, pubescent abaxially, at least on main veins at base; ovaries densely sericeous, style pubescent at least at base.

10. Corolla white, 3.5–4.8 cm long; capsule with exocarp not separating from the adnate mesocarp and endocarp; endemic to Cuba . . . . 3. *D. gnaphalantha*

10′. Corolla magenta or lavender, 4.5–8.8(rarely 10) cm long; capsule with exocarp separating from the adnate mesocarp and endocarp; Mexico and Nicaragua . . . . 6. *D. laxiflora*

1. **Distictis buccinatoria** (DC.) A. H. Gentry, Brittonia 25: 237. 1973. *Pithecoctenium buccinatorium* DC. in A. DC., Prodr. 9: 195. 1845. *Pithecoctenium buccinatorium* var. *subinclusum* DC. in A. DC., Prodr. 9: 195. 1845. *Phaedranthus buccinatorius* (DC.) Miers, Proc. Roy. Hort. Soc. London 3: 182. 1863, "*buccinatorum.*" TYPE: Mexico. s. loc., 1833, *M. Mairet de Chaudefont s.n.* (lectotype, designated here, G-DC not seen, microfiche G-DC 9.195.6!, photo F neg. 7655!).

Pithecoctenium buccinatorium var. *exsertum* DC. in A. DC., Prodr. 9: 195. 1845. *Phaedranthus exsertus* (DC.) Miers, Proc. Roy. Hort. Soc. London 3: 183. 1863. TYPE: Mexico. s. loc., 1832, *L. Alamán s.n.* (lectotype, designated here, G-DC not seen, microfiche G-DC 9.195.6!).

Bignonia ghiesbreghtii C. Heller ex Peyr., Linnaea 30: 45. 1859, "*giesbreghtii.*" TYPE: Mexico. Toluca, 8200 ft., s.d., *C. Heller 390* (holotype, IB not seen; isotype, W!).

Phaedranthus lindleyanus Miers, Proc. Roy. Hort. Soc. London 3: 182. 1863. TYPE: Mexico. s. loc., "in hort. Soc. Hort. Cult., anno 1834," *W. Lambert s.n.* (holotype, CGE!).

Young branchlets weakly hexangular, the angles ribbed and sometimes detaching with age, golden, velutinous, villose, or glabrous with only nodes pilose, trichomes simple, glabrescent; pseudostipules foliaceous, ovate or lanceolate (rarely obovate), 5–35 × 5–28 mm, frequently persistent. Leaves bifoliolate, frequently with tendrils, tendrils usually trifid (rarely 5-fid), tips usually filamentous, infrequently disk-like; petiole 1–2.5 cm, velutinous, pilose or glabrous; petiolule 0.9–3 cm, velutinous, pilose or glabrous; leaflets lanceolate, 5–10.5 × 3–6.1 cm, membranous, 3 or 4 pairs of lateral veins, tertiary veins reticulate, midrib and lateral veins slightly impressed adaxially and prominent abaxially, adaxial surface drying greenish brown, densely soft puberulent overall or trichomes restricted to major veins, or glabrous overall, sometimes scattered lepidote, abaxial surface drying golden green, densely to scattered pilose or trichomes just along main veins and in nerve axils, densely pellucid-lepidote, usually with large glands scattered near base, base obliquely truncate (rarely obtuse), apex acute with tip apiculate. Inflorescence a raceme or racemose panicle, peduncle with rachis 4–24 cm with 4 to 17 flowers, peduncle, rachis, and pedicels villose or pilose, or peduncle and/or rachis glabrous, bracteoles affixed along length of pedicel, linear, 4–9 × 0.5–1.5 mm, early caducous; calyx 10–14 × 10–13 mm, coriaceous, densely golden tomentose or pilose, external glandular fields short and broad, obscured by trichomes, apex denticulate; corolla opening with tube yellow and lobes red or orange-red, all turning red with age, weakly zygomorphic, gradually tubular-infundibular from cylindric base, (rarely 5.2)7.5–12 cm, subcoriaceous to coriaceous, externally golden tomentose above glabrous base, tube (rarely 4.4)7–9 cm with cylindric base (rarely 12)15–27 mm and mouth 14–28 mm wide, internally villose at insertion of stamens, otherwise glabrous, lobes 7–30 × 10–25 mm, externally without glandular fields at base, internally lepidote, papillose or minutely tomentose; stamens and staminode inserted 25–35 mm from base of corolla tube, shorter stamens with filaments 35–55 mm, included to exserted, longer stamens with filaments 50–65 mm, slightly exserted at mouth of corolla tube to 20 mm beyond, all anthers 5–7 mm, staminode 12–28 mm; disc 1.5–3 × 4–6 mm; pistil 7.3–8 cm, ovary ellipsoid or oblong, 7–8 × 4.5–5 mm, densely sericeous, style subexserted, pilose at base to lower half, stigma lanceolate to elliptic. Capsule oblong-elliptic, 13–15 × 4–5.5 cm, ca. 2.5 cm in diam., base acute, apex acute with tip rounded and retuse, valves convex but slightly compressed, exocarp not separating from the adnate mesocarp and endocarp at maturity, glabrous, surface with ± longitudinal wrinkles, midrib slightly raised apically, wall ca. 4 mm thick. Seeds 1–1.3 × 4–4.5 cm, body glabrous, the wings well demarcated from the seed body, off-white, membranous, hyaline.

Figure: Lindley (1830: plate 1301, as *Bignonia "cherere"*), Menninger et al. (1970: plate 39, as *Phaedranthus buccinatorius*).

Distribution. Native to central and southern Mexico, from San Luis Potosí and Jalisco to Chiapas. Found in rocky areas between 1700 and 2300 m elevation (Fig. 1A).

Phenology. Flowering April, May, June, and August. Fruiting collection examined was from cultivated material.

Common name. Mexican Blood Trumpet (Menninger et al., 1970).

Uses. Cultivated in tropical and subtropical areas of the world for its beautiful flowers. Menninger et al. (1970: 112) declared, "The blood trumpet is one of the loveliest and showiest of evergreen climbers in the warm gardens of the earth."

De Candolle (1845) published *Pithecoctenium buccinatorium* with two varieties, α, *P. buccinatorium* var. *subinclusum*, and β, *P. buccinatorium* var. *exsertum*. There has been some confusion as to the types of these names. For the species name de Candolle stated "in Mexico legit cl. *Mairet* Necomensis *Bignonia buccinatoria* Mair. in litt. 1833," and indicated that he had a herbarium specimen (de Candolle, 1845: 195). For *P. buccinatorium* var. *subinclusum*, he also indicated that he had a herbarium specimen but did not identify the collector, implying that the type of both variety *subinclusum* and the species was the same, *Mairet s.n.* (G-DC; de Candolle, 1845). For *P. buccinatorium* var. *exsertum*, no dried material was referred to, but he stated (de Candolle, 1845: 195) "cum prior a cl. *Mairet* comm.," suggesting that this was the "*Bignonia buccinatoria*" Mairet had collected. In Gentry's synopsis of *Distictis*, he cited the holotype of both *P. buccinatorium* and *P. buccinatorium* var. *exsertum* as "Mexico. *Mairet s.n.* (G-DC)" (Gentry, 1974a: 495) and did not include the name *P. buccinatorium* var. *subinclusum*. Microfiches from G-DC indicate that there are three elements in that herbarium labeled *Bignonia buccinatoria/Pithecoctenium buccinatorium*, none with variety indicated. One sheet is of a disarticulated flower bud, but no collector is indicated and it is dated 1838; the second sheet is of a flowering branchlet with two open flowers, the anthers not visible, and it is labeled "Mexique, *Mairet de la [Chaudefont]*. 1833"; and the third sheet includes open flowers with the stamens far exserted and it is labeled "Mexique. *M. Alaman*. 1832." The *Alamán* collection matched de Candolle's (1845) description of *P. buccinatorium* var. *exsertum* and was, therefore, chosen as the lectotype of this variety and the *Mairet* collection chosen as the lectotype of the species and variety *subinclusum*. *P. buccinatorium* var. *exsertum* is treated here as a synonym of *P. buccinatorium*.

Type materials of *Bignonia ghiesbreghtii* and *Phaedranthus lindleyanus* were examined in this study, and, based on these observations, the species were placed in synonymy of *Distictis buccinatoria*, thereby following Gentry (1974a).

The preceding description is based largely on herbarium specimens taken from cultivated plants. The large, rather narrow, tubular-infundibular, orange-red corolla appears to be adapted toward hummingbird pollination. *Distictis buccinatoria* has been hybridized with *D. laxiflora* to form the cultivar *Distictis* cv. 'Rivers,' and marketed as "Distictis riversii" (a name with no scientific standing) (Menninger et al., 1970: plate 42). *Distictis* cv. 'Rivers' has large (9–9.5 cm long) corollas with purple lobes and a yellow tube and throat, and included stamens. Another form of the hybrid is also grown, with purple corollas ca. 5.5 cm long and exserted anthers. It is not known if *D. buccinatoria* and *D. laxiflora* hybridize naturally.

Distictis buccinatoria and *D. laxiflora* are the only species of *Distictis* found in Mexico. They can appear quite similar vegetatively and in flower, but the corollas of *D. laxiflora* are magenta or lavender, usually smaller than those of *D. buccinatoria* (4.5–8.8 cm long), and the stamens are included. The fruits of *D. laxiflora* are also smaller (8.5–10.5 cm long), more elliptic, and with the apex acute to acuminate, the tip not rounded and retuse, and the exocarp separates from the adnate mesocarp and endocarp at maturity. Vegetatively, *D. laxiflora* tends to have less persistent pseudostipules and smaller leaflets (2–8.5 × 1–6 cm) than *D. buccinatoria*.

Selected specimens examined. MEXICO. **Chiapas:** Pajal Ton, 2 km al N de la cabecera de Amatenango, *J. López P. 310* (MO). **Jalisco:** El Terrero, Mpio. Tonila, limestone plateau betw. Volcán de Colima and Sierra Madre de Manantlan, 32 km NW of city of Colima, *L. M. González V. et al. 3667* (photocopy and line drawing of IBUG at MO). **México:** Purificación, Texcoco, *E. Matuda 18859* (MO). **Morelos:** Mtns. above Tepoztlán, *O. Nagel 8001* (AMES). **Puebla:** s. loc., *D. Bilimek 230* (GH). **San Luis Potosí:** s. loc., *J. G. Schaffner 746* (GH). **Tlaxcala:** St. Ana, *C. Conzatti 929* (GH).

2. **Distictis frutescens** (DC.) A. Pool, comb. nov. *Pithecoctenium frutescens* DC. in A. DC., Prodr. 9: 196. 1845. TYPE: Brazil. s. loc., 1832, *J. Lhotsky s.n.* (holotype, G-DC not seen, microfiche G-DC 196.15!, photo F neg. 7651!).

Pithecoctenium stipulare Mart. ex DC. in A. DC., Prodr. 9: 194. 1845. Syn. nov. *Anomoctenium stipulare* (Mart. ex DC.) Pichon, Bull. Soc. Bot. France 92: 227. 1946. *Distictis stipularis* (Mart. ex DC.) A. H. Gentry, Ann. Missouri Bot. Gard. 61: 498. 1974, non Mart. ex Glaz., 1911. TYPE: Brazil. Bahia, s.d., *C. F. Martius 2079* (lectotype, designated by Gentry, 1974a: 498, M!, photo K neg. 5949!).

Distictis stipularis Mart. ex Glaz., Bull. Soc. Bot. France 58 (Mém. 3f): 525. 1911. Syn. nov. TYPE: Brazil. Belem, dans les bourbiers, Rio-Jan., 1886, *A. Glaziou 8812* (holotype, P not seen; isotype, G!, K not seen).

Young branchlets sharply hexangular, the angles ribbed and detaching with age, with scattered to dense, ferruginous, dendritic trichomes less than 0.3 mm, some furfuraceous and without rachis mixed with ones with rachis, the trichome arms numerous, arms and internodes equally small; pseudostipules foliaceous, broadly ovate, 6–20 × 7–20 mm, persistent. Leaves bifoliolate frequently with tendrils, tendrils trifid, tips filamentous; petiole 1–2.6(rarely 3) cm, with trichomes like those of branchlet, especially dense adaxially; petiolule 0.3–1.2 cm, with trichomes like those of branchlet, especially dense adaxially; leaflets oblong-elliptic, 3–12 × 2–7.2 cm, subcoriaceous, 3 or 4 pairs of lateral veins, tertiary veins reticulate, midrib and lateral veins slightly impressed with tertiary veins flat or slightly prominent (rarely all flat) adaxially, midrib and lateral veins prominent abaxially with tertiary veins flat or slightly prominent, adaxial surface drying dark greenish brown or reddish brown, with trichomes on midrib like those of branchlet, sometimes scattered lepidote, abaxial surface drying dark to light brown-green, with dendritic trichomes along midrib and in basal lateral vein axils, trichomes white to tawny, less than 0.3 mm, but with fewer and longer arms than the trichomes found on branchlet (sometimes mixed with the branchlet-type trichomes), scattered pellucid-lepidote, occasionally with large glands, base obliquely rounded to subcordate, apex acute to rounded with tip apiculate and usually curving. Inflorescence a raceme, peduncle with rachis 4–12.5 cm with 2 to 8 flowers, peduncle, rachis, and pedicels with dense trichomes like those of branchlet, bracteoles affixed at base of pedicel, oblong or elliptic, 13–22 × 2–8 mm, persistent; calyx 5–8 × 6–8 mm, subcoriaceous, tomentose with furfuraceous-dendritic trichomes strongly appressed, rarely with a few trichomes with rachis, external glandular fields short and broad, apex denticulate; corolla with tube externally cream to yellow and internally yellow to orange and lobes lilac to mauve, weakly zygomorphic, gradually tubular-infundibular or tubular-campanulate from cylindric base, 5.5–10.2 cm, subcoriaceous to membranous, externally with scattered to dense minute dendritic trichomes above glabrous base, tube 4.5–7.5 cm with cylindric base 10–15 mm and mouth 15–30 mm wide, internally villose at insertion of stamens, otherwise glabrous, lobes 15–25 × 15–35 mm, externally with linear glandular fields at base, internally lepidote; stamens and staminode inserted 12–20 mm from base of corolla tube, shorter stamens with filaments 12–20 mm, included, longer stamens with filaments (rarely 20)27–30 mm, included, all anthers 3–4.5 mm, staminode 4–8 mm; disc ca. (1.5)2 × 4 mm; pistil 5–5.6 cm, ovary ovoid, ca. (3)4 × 2 mm, densely short velutinous with simple trichomes at base mixed with small dendritic trichomes apically, style included, with dendritic trichomes at base to lower 2/3, stigma oblong. Capsule wide elliptic, 4–8 × 2–4 cm, base attenuate, apex acute with apiculate tip, puberulent-tomentose. Seeds small winged, dark brown.

Figure: Gomes (1952: plate 4, as *Distictella nigrescens* (Bureau & K. Schum.) J. C. Gomes).

Distribution. Eastern coast of Brazil, from Paraíba to Rio de Janeiro. Found in coastal vegetation or edge of wet forest, often along rivers, near sea level (Fig. 1B).

Phenology. Flowering August, October, November, and March. Fruiting collections not seen.

No reference to common name or economic use was found for this species.

Type materials of *Pithecoctenium frutescens* DC., *P. stipulare* Mart. ex DC., and *Distictis stipularis* Mart. ex Glaz. were examined in this study and found to be synonymous. In publishing *D. stipularis*, Glaziou (1911: 525) cited "*D. stipularis* Mart. sp. n. ? in herb. Mus. Paris.–Belem, dans les bourbiers, Rio-Jan., no *8812*. Haute liane, fl. violet foncé." It might be argued that Glaziou intended to transfer *P. stipulare* Mart. ex DC. to *Distictis* based on material that he had seen at P annotated "*Distictis stipularis* Mart." However, by citing "sp. n.?" it seems clear that he did not know that this species had been published. It might be suggested that as both de Candolle (1845) and Glaziou (1911) employed the same epithet and Glaziou (1911) referred to material at P, Article 33.3 of the *International Code of Botanical Nomenclature* (McNeill et al., 2006: 63) as illustrated in Ex. 8 applies. However, for a species with such large pseudostipules, the use of the same epithet "stipularis" could easily be coincidental. In addition, we do not know the material Glaziou saw at P (Glaziou, 1911) to be duplicates of the material that de Candolle saw at M (de Candolle, 1845), as there are a number of other candidates, as cited in Bureau and Schumann (1896), and as Glaziou (1911) specifically cited his own number, *8812*. It seems, therefore, that application of Article 33.3 of the *International Code of Botanical Nomenclature* (McNeill et al., 2006) is too great a stretch. It might also be argued that Glaziou's (1911) description is not diagnostic (Article 32.1, Ex. 3 in McNeill et al., 2006). However, the other species included are described as sarmentose shrubs with white or yellow flowers. Therefore, it is proposed that *D. stipularis* Mart. ex Glaz. was validly published as a new taxon and that Gentry's (1974a) combination *D. stipularis* (Mart. ex DC.) A. H. Gentry is a later homonym of *D. stipularis* Mart. ex Glaz. (Glaziou, 1911) and therefore illegitimate (Article 53.1 in McNeill et al., 2006), thus necessitating the new combination, *D. frutescens* (DC.) A. Pool. This is not a decision made lightly, as the names *P. stipulare* Mart. ex DC., *Anomoctenium stipulare* (Mart. ex DC.) Pichon, and *D. stipularis* (Mart. ex DC.) A. H. Gentry have been steadily employed since the time of de Candolle for this species of somewhat limited distribution and no known use, while *P. frutescens* DC. has been ignored.

The syntypes of *Anemopaegma nigrescens* Bureau & K. Schum. (and *Distictella nigrescens* (Bureau & K. Schum.) J. C. Gomes), *F. Sello 398* (B) and "idem *L.*" [= *Lhotzky*?] *313* (B), were not seen in this study and are presumed destroyed. However, duplicates, while not definitely seen, probably exist. Gentry (1974a) proposed that the "idem *L.*" of Bureau and Schumann (1896: 126) referred to *Luschnath*, but it seems more probable that it stands for *Lhotzky* (a collection of Lhotzky was cited below the preceding species), and it is even possible that this *L. 313* at B is a duplicate of the holotype of *Pithecoctenium frutescens*, *Lhotsky s.n.* (G-DC). In this case, *A. nigrescens* would be a superfluous name for *P. frutescens*, a name not included in Bureau and Schumann (1896). It seems premature to lectotypify this name; however, the placement of the taxon seems clear. Not only is the original description of Bureau and Schumann (1896) for *A. nigrescens* Bureau & K. Schum. very similar to their description of *P. stipulare* Mart. ex DC., but they also cite one of the syntypes of *A. nigrescens*, *Sello 398*, under *P. stipulare* (Bureau & Schumann, 1896). This last argument was previously presented by Sandwith (1965) who placed *A. nigrescens* Bureau & K. Schum. and *Distictella nigrescens* (Bureau & K. Schum.) J. C. Gomes in synonymy of *P. stipulare*. Gentry treated *A. nigrescens* and *Distictella nigrescens* as synonyms of *Distictis stipularis*. They are considered here to be synonyms of *Distictis frutescens*; however, as the syntypes of *A. nigrescens* have not been examined in this study, the names are not listed in formal synonymy.

Fruiting material and seeds were not seen in this study; descriptions here are adapted from Gomes (1952). Gomes' (1952) description of the seed as small winged and dark brown suggests that it might be similar to the seed of *Distictis occidentalis*, which has a corky seed body and small coriaceous wings poorly demarcated from the seed body, modifications associated with water dispersal.

Distictis frutescens, *D. granulosa*, *D. occidentalis*, *D. scabriuscula*, and *D. steyermarkii* possess dendroid trichomes on many parts and rows of glands on the external surface of the corolla at the base of the corolla lobes, features not found in the other species of *Distictis*. *Distictis frutescens* differs from these other species in having large foliaceous pseudostipules (6–20 × 7–20 mm), while the others either lack pseudostipules or have very small, inconspicuous ones (2–8 × 1.5–5 mm) and larger, foliaceous bracteoles (13–22 × 2–8 mm vs. 1.5–12 × 0.5–2 mm).

Selected specimens examined. BRAZIL. **Bahia:** Mpio. Caravelas, Juerana, *G. Hatschbach & F. J. Zelma 50752* (MO); coastal zone, 11 km S of Santa Cruz, Cabrália, *R. M. Harley et al. 17088* (photograph of K at MO). **Espírito Santo:** Mpio. São Mateus, Rio Preto do Sul, BR-101, *G. Hatschbach & O. Guimaraes 46986* (MO); Goitacazes, Rio Doce, *J. G. Kuhlmann 6532* (MO). **Minas Gerais:** s. loc., *Ackermann s.n.* (BR). **Paraíba:** Mpio. Rio Tinto, BR-101, proximo ao Rio Muriri, *L. G. Lohmann et al. 695* (MO). **Rio de Janeiro:** Campos, Rio Paraiba, *E. P. Heringer 1306* (MO).

3. Distictis gnaphalantha (A. Rich.) Greenm., Proc. Amer. Acad. Arts 33: 487. 1898. *Bignonia gnaphalantha* A. Rich. in Sagra, Hist. Fis. Cuba, Bot. 11: 105. 1850. *Distictis gnaphalantha* (A. Rich.) Urb., Repert. Spec. Nov. Regni Veg. 14: 310. 1916, nom. illeg. TYPE: Cuba. La Habana, s.d., *R. de la Sagra s.n.* (holotype, P not seen, digitized image!; isotypes, P not seen, digitized image! [2]).

Distictis rhynchocarpa Urb., Symb. Antill. 9: 253. 1924. *Distictis gnaphalantha* subsp. *rhynchocarpa* (Urb.) Borhidi & O. Muñiz, Bot. Közlem. 58: 176. 1971. TYPE: Cuba. Oriente: Santiago de Cuba, *E. L. Ekman 1388* (holotype, S not seen).

Young branchlets generally sharply hexangular, the angles ribbed and detaching with age, densely puberulent with simple trichomes; pseudostipules foliaceous, suborbicular, 3–23 × 3–20 mm, usually persistent. Leaves bifoliolate, frequently with tendrils, tendrils trifid, tips often disk-like; petiole 0.4–2.4 cm, densely puberulent to pilose; petiolule 0.1–0.7 cm, densely puberulent to pilose; leaflets broadly elliptic to elliptic or oblong, 1.7–6.3 × 1.2–4.4 cm, membranous, 3 or 4 pairs of lateral veins, tertiary veins reticulate, midrib, lateral and tertiary veins impressed adaxially (or tertiary veins flat), midrib and lateral veins prominent abaxially, adaxial surface drying dark olive-green to almost black, puberulent overall or at least on main veins, conspicuously pellucid-lepidote, abaxial surface drying yellow-green to dark green, puberulent overall or at least on main veins at base, densely pellucid-lepidote, sometimes with large glands scattered but especially dense in lower lateral vein axils, base obliquely truncate, apex rounded to acute with tip apiculate or retuse. Inflorescence a panicle, peduncle with rachis 1–17 cm with 2 to 10 flowers, peduncle, rachis, and pedicels densely puberulent and lepidote, bracteoles affixed at base of pedicel, linear, ca. 4 × 0.5 mm, early caducous; calyx 4–7 × 5–6 mm, membranous to subcoriaceous, pubescent with minute appressed trichomes, lepidote, external glands scattered or arranged in short, broad glandular fields, apex generally denticulate; corolla white, weakly zygomorphic, gradually tubular-infundibular to tubular-campanulate from cylindric base, 3.5–4.8 cm, membranous to subcoriaceous, externally lepidote or tomentose and lepidote above glabrous base, tube 2.8–3.5 cm with cylindric base 5–9 mm and mouth 10–16 mm wide, internally with ring of trichomes at insertion of stamens, otherwise glabrous, lobes 7–12 × 8–13 mm, externally without glandular fields at base, internally with trichomes scattered to dense; stamens and staminode inserted ca. 11 mm from base of corolla tube, shorter stamens with filaments ca. 13 mm, included, longer stamens with filaments 17–20 mm, included, all anthers ca. 3 mm, staminode ca. 4 mm; disc ca. 2 × 3 mm; pistil 3.1–3.2 cm, ovary ovoid to oblong, 3–4 × 2–2.5 mm, densely sericeous, style included, pubescent along basal half, stigma oblong. Capsule elliptic, 3–7 × 1.5–2.5 cm, base acute and truncate, apex acuminate, valves convex, exocarp not separating from the adnate mesocarp and endocarp at maturity, glabrous (pubescent when young), surface warty-glandular, midrib subevident to impressed, wall ca. 1 mm thick. Seeds not seen.

Figure: Liogier (1957: fig. 182).

Distribution. Endemic to Cuba. Found in forest over limestone between 100 and 300 m elevation (Fig. 1A).

Phenology. Flowering February to July.

Common names. Bejuco logarti (Liogier, 1957; under *Distictis rhynchocarpa*).

No reference to economic use was found for this species.

Urban (1916a) has been credited with transferring *Bignonia gnaphalantha* to *Distictis* (Liogier, 1957; Gentry, 1974a); however, the transfer had been made previously by Greenman (1898).

Urban (1924) published the new species *Distictis rhynchocarpa* Urb., and Borhidi and Muñiz (1971) treated *D. rhynchocarpa* as a subspecies of *D. gnaphalantha*, distinguishing it from *D. gnaphalantha* based on its retuse versus apiculate leaflet apex. As this character is very variable and can even vary on leaflets of the same specimen, *D. rhynchocarpa* is considered here to be a synonym of *D. gnaphalantha*. This follows Gentry (1974a).

Only two species of *Distictis* are found on Cuba, *D. lactiflora* and *D. gnaphalantha*. They have very similar flowers, differing primarily in the lepidote (and usually otherwise glabrous) ovary of *D. lactiflora* versus the densely sericeous one of *D. gnaphalantha*. Vegetatively, *D. lactiflora* differs in having small, narrow, caducous pseudostipules (3–5 × 1–2.2 mm) and leaflets that are coriaceous with venation conspicuously prominent on the adaxial surface and glabrous on the abaxial surface. *Distictis gnaphalantha* is similar to *D. laxiflora* vegetatively, but *D. laxiflora* (from Mexico and Nicaragua) has larger (4.5–8.8 cm), magenta or lavender corollas.

No complete mature fruit of *Distictis gnaphalantha* were seen in this study. The fruit description is based on one old valve and one immature fruit of *C. Wright 3050*, and from Liogier (1957), and Urban (1924).

Selected specimens examined. CUBA. s. loc., *C. Wright 3050* (MO). **La Habana:** Escaleras de Jaruco, ca. 60 km SE of Habana, *A. H. Gentry 50829* (MO). **Oriente:** Antilla (ad Nipe Bay), *E. L. Ekman 7324* (MO); Santiago de Cuba, *E. L. Ekman 19185* (MO). **Santa Clara:** Cienfuegos, *R. Combs 106* (MO).

4. Distictis granulosa Bureau & K. Schum. in Mart., Fl. Bras. 8(2): 179. 1896. *Distictella granulosa* (Bureau & K. Schum.) Urb., Repert. Spec. Nov. Regni Veg. 14: 310. 1916. *Pithecoctenium granulosum* (Bureau & K. Schum.) Sprague & Sandwith, Bull. Misc. Inform. Kew 1932: 89. 1932. *Anomoctenium granulosum* (Bureau & K. Schum.) Sandwith, Kew Bull. 19: 413. 1965. TYPE: Guyana. s. loc., s.d., *R. H. Schomburgk 229 S* (neotype, designated here, K not seen, digitized image!, photo K neg. 4302 not seen).

Pithecoctenium uleanum Kraenzl., Notizbl. Königl. Bot. Gart. Berlin 6: 377. 1915. TYPE: Brazil. Rio Branco (Terr. Roraima), Nov. 1911, *E. Ule 7706* (lectotype, designated here, G not seen, photo F neg. 26202!).

Young branchlets sharply hexangular, the angles ribbed and detaching with age, with scattered to dense, golden to ferruginous, dendritic trichomes to 0.15 mm, some furfuraceous and without rachis, sometimes mixed with ones with rachis, the trichome arms usually numerous (rarely less than 4), occasionally longer than the internodes; pseudostipules absent or rarely present, not foliaceous, oblong, 2–4 × 1.5–2 mm, caducous. Leaves bifoliolate, often with tendrils, tendrils trifid, tips filamentous; petiole 0.6–4 cm, with trichomes like those of branchlet; petiolule 0.5–2.5 cm, with trichomes like those of branchlet; leaflets obovate or oblong-elliptic (rarely broad elliptic), 7–19 × 3.5–10.5 cm, subcoriaceous to coriaceous, 3 or 4 pairs of lateral veins, tertiary veins mostly parallel and ladder-like, rarely weakly reticulate, midrib and lateral veins impressed adaxially and tertiary veins flat (or rarely tertiary veins impressed), midrib and lateral veins prominent abaxially with tertiary veins flat or prominent, adaxial surface usually drying reddish brown (rarely brownish green), with trichomes on midrib like those of branchlet (rarely glabrous), sometimes scattered lepidote, abaxial surface drying olive-green often with grayish cast, with trichomes like those of branchlet occasionally scattered on surface, usually restricted to midrib or midrib and lateral veins, scattered pellucid-lepidote, occasionally with large glands, base obliquely obtuse or rounded, or cuneate and then rounded, apex obtuse with tip cuspidate and apiculate, and often curving, rarely truncate and tip cuspidate or retuse. Inflorescence a raceme, peduncle with rachis 6–18 cm with 8 to 16 flowers, usually fragile and breaking in collections, peduncle, rachis, and pedicels with trichomes like those of branchlet, bracteoles affixed at base of pedicel, broadly oblong or spatulate, 1.5–2 × 1 mm, usually persistent; calyx (rarely 5)6–10 × (rarely 6)8–11 mm, subcoriaceous, tomentose with furfuraceous-dendritic trichomes strongly appressed, external glandular fields narrow and oblong, apex denticulate (rarely truncate); corolla with tube externally yellow or white and internally yellow and lobes purple or lavender, weakly zygomorphic, gradually tubular-infundibular or tubular-campanulate from cylindric base, (rarely 5.5)6.2–9 cm, subcoriaceous to membranous, externally with dense minute dendritic trichomes above glabrous base, tube (rarely 4)4.5–6.5(rarely 7) cm with cylindric base 8–15 mm and mouth 20–25 mm wide, internally villose at insertion of stamens, otherwise glabrous, lobes (rarely 10)15–30 × 20–35 mm, externally with linear glandular fields at base, internally with scattered minute dendritic trichomes; stamens and staminode inserted 11–12(rarely 14) mm from base of corolla tube, shorter stamens with filaments 15–21 mm, included, longer stamens with filaments 19–31 mm, included, all anthers (rarely 3)3.5–5 mm, staminode 2–5 mm; disc 2–2.2 × 4.2–5 mm; pistil 4.7–5 cm, ovary ovoid, (rarely 3)4–4.5 × 2–2.5 mm, densely tomentose with furfuraceous-dendritic trichomes, style included, with dendritic trichomes at base to lower 3/4, stigma narrow elliptic. Capsule elliptic, (rarely 7)8.5–11 × (rarely 2.5)3–4.5 cm, ca. 0.5 cm in diam., base acute and truncate, apex acuminate or acute, valves convex, exocarp not separating from the adnate mesocarp and endocarp at maturity, densely furfuraceous-dendritic appressed tomentose, scattered large glands, midrib impressed or slightly prominent, wall ca. 1 mm thick. Seeds (rarely 1)1.2–2.7 × (rarely 2.8)3.3–4.8 cm, body pubescent, the wings well demarcated from the seed body, tawny, membranous, hyaline.

Distribution. Northern South America: Colombia (Gentry, 1982b), along the border of Venezuela with Colombia, Apure, Bolívar, and Amazonas in Venezuela, throughout the Guianas (from Guyana, known only from type), northern Brazil bordering the Amazon and its tributaries, Madre de Dios and Puno in Peru, and La Paz, Bolivia. Found in moist or wet forest, sometimes disturbed, frequently characterized as terra firme on sandy soil, between 30 and 1200 m elevation (Fig. 2B).

Phenology. Flowering: January, February, March, May, July, September, October, November, and December, and fruiting March, July, September, November, and December.

No reference to common name or economic use was found for this species.

Bureau and Schumann (1896) published *Distictis granulosa* citing only *M. R. Schomburgk 400*, which was housed at B and is presumed destroyed. Gentry (1982b) reported an isotype of *M. R. Schomburgk 400* at K; however, the staff at K was unable to find this specimen in 2006 and believe that they do not have it. Sprague and Sandwith (1932b) published the combination *Pithecoctenium granulosum* (Bureau & K. Schum.) Sprague & Sandwith, citing *M. R. Schomburgk 400* (B), *R. H. Schomburgk 229 S* (K), and *Ule 7706* (K). Judging from their treatment of other taxa in this paper, it appears that they have cited all material for the taxa treated, including herbaria, and that they studied material from B, BM, BR, GOET, K, and P. If they had seen *M. R. Schomburgk 400* from herbaria other than B, they would have most likely included this information. This, in addition to the absence of actual specimens of *M. R. Schomburgk 400* in the database of the Schomburgks' collections compiled by the Nationaal Herbarium Nederland (<http://www.nationaalherbarium.nl/>), suggests that there are no extant specimens of *M. R. Schomburgk 400*, necessitating the selection of a neotype. *R. H. Schomburgk 229 S* (K) is the most logical choice for a neotype: in 1931, Sprague and Sandwith identified *R. H. Schomburgk 229 S* (K) as *Pithecoctenium granulosum* (Bureau & K. Schum.) Sprague & Sandwith (= *Distictis granulosa* Bureau & K. Schum.) and annotated the sheet as "compared with the type at B." It is also known that M. R. Schomburgk and R. H. Schomburgk collected together in Guyana (Stafleu & Cowan, 1985; <http://www.nationaalherbarium.nl/>), increasing the likelihood of *M. R. Schomburgk 400* (B) and *R. H. Schomburgk 229 S* (K) having been collected at the same locality and even, perhaps, being virtual duplicates. The latter has been implied in other instances (e.g., Sprague & Sandwith, 1932a: 21; in which *M. R. Schomburgk 980* = *R. H. Schomburgk 641* and *M. R. Schomburgk 928* = *R. H. Schomburgk 658*).

The holotype of *Pithecoctenium uleanum* Kraenzl. at B is presumed destroyed. A photo of an isotype of *P. uleanum* at G was observed, the specimen at G chosen as the lectotye, and the name placed in synonymy of *Distictis granulosa*, thereby following the synonymy of Gentry (1974a).

Kränzlin (1921:118) published the name *Distictis rosea* Kraenzl. and Sampaio (1935: 118) transferred *D. rosea* to *Distictella*. The holotype, *Ule 53b* (Brazil. Amazonas: Marary Jusua, 5 Sep. 1900), was at B and is presumed destroyed. No duplicates were seen in this study, but the digitized image of a photo of the holotype (K neg 696) was seen and *D. rosea*, based on this image and the original description, can be assigned to the synonymy of *Distictis granulosa*. A neotype has not been chosen as Ule specimens are widely distributed and it is hoped that a duplicate of *Ule 53b* will eventually be found.

Distictis granulosa is very similar to both *D. frutescens* and *D. scabriuscula*, all of which have purple corolla lobes, dendritic trichomes, and glandular fields at the base of the corolla lobes. *Distictis frutescens* differs from the other two in having large foliaceous pseudostipules (6–20 × 7–20 mm), the tertiary veins of the leaflets reticulate versus generally ladder-like, the calyx denticules more distinct, and the calyx glandular fields somewhat broader. *Distictis scabriuscula* and *D. granulosa* are very similar but can be separated by several, sometimes overlapping characteristics. The trichomes of *D. scabriuscula* are longer than those of *D. granulosa* (to 0.3 mm vs. 0.15 mm long) and generally more dense and persistent, but as these trichomes tend to mat, and in both cases the trichomes are very small, this is not the most useful character to use for purposes of identification. The leaflets of *D. scabriuscula* are membranous to chartaceous, elliptic, and often smaller (4–10.2 × 2–6.2 cm) than the coriaceous, often obovate, and larger (7–19 × 3.5–10.5 cm) leaflets of *D. granulosa*. In addition, the midrib and lateral veins of the leaflets of *D. scabriuscula* are flat on the adaxial surface versus impressed in *D. granulosa*. The bracteoles of *D. scabriuscula* are caducous, narrow, and long (6–11 × 0.5–1 mm) versus much more persistent, short, and relatively broad (1.5–2 × 1 mm) in *D. granulosa*. Finally, *D. scabriuscula* appears to be restricted to central-eastern Brazil, where *D. granulosa* has not been found.

Prior to Gentry (1992), specimens of *Distictis* with white flowers from northwestern South America were included in *D. granulosa*. Gentry (1992) recognized these white-flowered *Distictis* as a new species, *D. occidentalis*. The two are similar in type and distribution of dendritic trichomes, the shape, size, and persistence of pseudostipules, the leaflet size, shape, and ladder-like pattern of tertiary veins, the bracteole duration, overall flower size, calyx apex, and presence of corolla glandular fields. *Distictis occidentalis* differs from *D. granulosa* in the color of the corolla lobes (white vs. purple or lavender), leaflets chartaceous to membranous (vs. subcoriaceous to coriaceous) with lateral veins flat on the upper surface (vs. impressed), short and broad calyx glandular fields (vs. oblong), and seed wings that are very reduced and coriaceous-opaque (vs. well developed, membranous and hyaline). According to Gentry (1992), the two species overlap at Tambopata, Peru, with *D. occidentalis* occurring in swampy areas around lake margins and *D. granulosa* occurring in sandy upland forests.

Selected specimens examined. BOLIVIA. **La Paz:** Abel Iturralde, Province Alto Madidi, across from mouth of Río Enlatagua, *A. Gentry & S. Estensoro 70258* (MO). BRAZIL. **Amazonas:** Mpio. de Tefé, estrada do aeroporto, *I. L. Amaral et al. 160* (MO); Manaus–Caracarai Hwy., Km 50, BR 174, *G. T. Prance et al. 22656A* (MO). **Pará:** Macau airstrip, 1 1/2 hours upstream from Lageira airstrip on Rio Maicuru, *J. J. Strudwick et al. 3464* (MO); Senador José Porfirio (Sozel), margem direita do Rio Xingu, *G. dos Santos et al. 279* (MO). **Roraima:** BR 174 Manaus–Venezuela Hwy., Malacacheta, E of Boa Vista, *W. C. Steward et al. 253* (MO). FRENCH GUIANA. St. Laurent piste de paul Isnard, *C. Feuillet 1458* (MO). PERU. **Madre de Dios:** Tambopata, Explorer's Inn Tourist Camp at jct. of Ríos La Torre and Tambopata, *A. H. Gentry et al. 51393* (MO). **Puno:** Ridge betw. Río Candamo and Río Guacamayo, *A. Gentry et al. 76932* (MO). SURINAME. **Sipaliwini:** Voltzberg Nature Reserve, vic. of Voltzberg base camp, *B. Hoffman et al. 5310* (MO). VENEZUELA. **Amazonas:** Dept. Río Negro, Neblina Massif, Canyon Grande, along Río Mawarinuma betw. mouth of canyon and first major fork of river, ca. 7 airline km ENE of Puerto Chimo, *G. Davidse & J. S. Miller 27320* (MO). **Apure:** Dtto. Páez: Selva de Cutufí, betw. Cutufí on the Río Cutufí and the Río Sanare, *G. Davidse & A. C. González 21917* (MO). **Bolívar:** Tumeremo to Anacoco (N side of Cuyuni River), 64 km from Guyana frontier at Anacoco, *A. H. Gentry et al. 10657* (MO).

5. **Distictis lactiflora** (Vahl) DC. in A. DC., Prodr. 9: 191. 1845. *Bignonia lactiflora* Vahl, Symb. Bot. 3: 80, t. 66. 1794. *Macrodiscus lactiflorus* (Vahl) Bureau ex K. Schum. in Engl., Nat. Pflanzenfam. 4(3b): 216. 1894, "*lactiflora*." TYPE: St. Croix. s. loc., s.d., *F. A. F. C. West s.n.* (holotype, C not seen; isotype, BM!).

Bignonia rigescens Jacq., Pl. Hort. Schoenbr. 2: 44, t. 210. 1797. *Distictis rigescens* (Jacq.) DC. in A. DC., Prodr. 9: 191. 1845. *Macrodiscus rigescens* (Jacq.) Bureau, Monogr. Bignon. Atlas 13, t. 11. 1864. TYPE: tab. 210 in Jacq., Pl. Hort. Schoenbr. 2. 1797 (lectotype, designated here, tab. 210 in Jacq., 1797!).

Young branchlets sharply hexangular, the angles ribbed and detaching with age, densely puberulent or with few, small, simple trichomes, especially at nodes; pseudostipules not foliaceous, linear or elliptic, 3–5 × 1–2.2 mm, generally caducous. Leaves bifoliolate frequently with tendrils, tendrils trifid, tips often disk-like; petiole 0.5–2 cm, puberulent to pilose at least adaxially; petiolule 0.2–0.9 cm, puberulent to pilose at least adaxially; leaflets broadly elliptic or nearly orbicular to narrow-elliptic, 2–6 × 0.9–5 cm, subcoriaceous to coriaceous, 3 or 4(rarely 5) pairs of lateral veins, tertiary veins reticulate, midrib, lateral and tertiary veins conspicuously prominent on both surfaces but especially adaxially, adaxial surface drying yellow-green, glabrous, or puberulent on main veins, sometimes conspicuously pellucid-lepidote, abaxial surface drying yellow-green, glabrous, densely pellucid-lepidote, usually with large glands scattered but especially dense in lower lateral vein axils, base obliquely obtuse or rounded, apex rounded to acute or acuminate with tip retuse (rarely tip apiculate). Inflorescence a panicle (rarely raceme), peduncle with rachis 4–21 cm with 4 to 22 flowers, peduncle, rachis, and pedicels densely to scattered pubescent with small, appressed trichomes, bracteoles not known, early caducous; calyx 3–8 × 5–8 mm, membranous to subcoriaceous, pubescent with minute appressed trichomes to glabrous, lepidote, sometimes with scattered external glands or external glands arranged in short and broad glandular fields, apex truncate or rarely minutely denticulate; corolla pure white or white with pink or lavender flush, with yellow throat, weakly zygomorphic, gradually tubular-infundibular to tubular-campanulate from cylindric base, 3–5.5 cm, membranous to subcoriaceous, externally tomentose or puberulent with minute trichomes above glabrous base, tube 2.5–4 cm with cylindric base 5–10 mm and mouth 10–17 mm wide, internally with tufts of minute trichomes at insertion of stamens, otherwise glabrous, lobes 5–12 × 7–15 mm, externally without glandular fields at base, internally lepidote or minutely tomentose or papillose; stamens and staminode inserted 5–10 mm from base of corolla tube, shorter stamens with filaments 8–13 mm, included, longer stamens with filaments 14–18 mm, included, all anthers 2.7–3 mm, staminode 2–6 mm; disc 1–2 × 2.2–4 mm; pistil 2.1–3.2 cm, ovary ovoid or oblong, 3–4 × 1.5–2 mm, densely lepidote (rarely lepidote and puberulent), style included, glabrous, stigma elliptic to narrow elliptic. Capsule narrow elliptic to elliptic-fusiform, 4–9.9 × 1.5–2.7 cm, ca. 0.5 cm in diam., base acute and truncate, apex acuminate, valves convex, exocarp not separating from the adnate mesocarp and endocarp at maturity, glabrous, surface smooth, midrib subevident to impressed, wall ca. 1 mm thick. Seeds 0.6–1 × 1.3–2.3 cm, body glabrous or slightly papillose, the wings well demarcated from the seed body, light brown, membranous, hyaline.

Figure: Liogier (1995a: fig. 129-7).

Distribution. Cuba, Haiti, Dominican Republic, Puerto Rico, St. Croix, and St. Thomas (Liogier, 1957). Found in dry forests, dry roadside scrub, or dry coastal scrub, often on limestone, between sea level and 1000 m elevation (Fig. 2A).

Phenology. Flowering December to July and September; fruiting January, April, July, and October.

Common names. Liana fragante, Pegapalo, Viuda (Puerto Rico; Liogier, 1995a), Bejuco culebra, Liane blanche (Hispaniola; Liogier, 1995b).

Uses. Plants cultivated under this name are probably *Distictis laxiflora*; see discussion below the latter species.

Jacquin (1797) published *Bignonia rigescens* Jacq. with an informative description and excellent plate but without type citation, beyond the indication that it was from Caracas, and the latter citation is probably in error (Gentry, 1974a). No type specimen was found in this study or by Gentry (1974a), and apparently not by Britton (1925) or Bureau (1864), who cite the distribution as from the Antilles with no mention of a type from Caracas. In lieu of an actual specimen, the plate 210 is chosen here as the lectotype. The description and plate show that *B. rigescens* is synonymous with *Distictis lactiflora*, the only problems with this interpretation being that the stems are described as terete (vs. hexangular), but illustrated with definite angles, the leaf tendrils are illustrated as simple (vs. trifid), and it is cited as being from Caracas (*D. lactiflora* is known only from the West Indies). I follow Britton (1925), Gentry (1974a), and Liogier (1957, 1995a) in placing *B. rigescens* Jacq. in synonymy of *D. lactiflora* and assume that the Caracas citation is in error.

Bello (1881) published *Bignonia odorata* Bello, without indication of type (beyond country, Puerto Rico). The type is presumed to have been deposited at B and destroyed. *Bignonia odorata* was treated as synonymous with *Distictis lactiflora* by Bureau (1911), Britton (1925), Gentry (1974a), and Liogier (1995a). Judging from the description of Bello (1881), *B. odorata* is probably synonymous with *D. lactiflora*.

Vegetatively, *Distictis lactiflora* is similar to *D. staminea* in pseudostipule size, shape, and persistence, and leaflet size, texture, venation prominence, and apices. However, *D. staminea* differs from *D. lactiflora* in having leaflets that are pilose along the main veins abaxially and flowers that are orange and strongly bilabiate with the stamens exserted. The flowers of *D. lactiflora* are similar to those of *D. gnaphalantha*, but the latter has densely sericeous ovaries, foliaceous, persistent pseudostipules, and membranous leaflets with the veins impressed on the adaxial surface.

Selected specimens examined. CUBA. **Camaguëy:** Pastelillo, *E. L. Ekman 15549* (MO). DOMINICAN REPUBLIC. **Barahona:** 2 km S of Juancho, 26 km SW of Paraíso, *A. H. Gentry & M. Mejía 50736* (MO). **Peravia:** N of Baní, 13 km N of Cruce com Sanchez, *A. H. Gentry & M. Mejía 50814* (MO). HAITI. **Ouest:** Vic. of Cabaret, Baie des Moustiques, *E. C. Leonard & G. M. Leonard 12083* (MO). PUERTO RICO. **Guayama:** Salinas, *J. S. Miller & C. D. Sherman 6371* (MO). ST. CROIX. West-end, *J. J. Ricksecker 96* (MO).

6. Distictis laxiflora (DC.) Greenm., Proc. Amer. Acad. Arts 33: 486. 1898. *Pithecoctenium laxiflorum* DC. in A. DC., Prodr. 9: 195. 1845. TYPE: Mexico. Oaxaca. Julio, *G. Andrieux 220* (holotype, G-DC not seen, microfiche G-DC 9.195.7!; isotypes, M!, W!, photo F neg. 32869!).

Pithecoctenium cinereum DC. in A. DC., Prodr. 9: 195. 1845. *Distictis cinerea* (DC.) Greenm., Proc. Amer. Acad. Arts 33: 487. 1898. TYPE: Mexico. s. loc., 1833, *M. Mairet de Chaudefont s.n.* (lectotype, designated here, G-DC not seen, microfiche G-DC 9.195.10!, photo F neg. 7653!).

Pithecoctenium cinereum var. *parviflorum* Hochr., Bull. New York Bot. Gard. 6: 287. 1910. Syn. nov. TYPE: Mexico. Rocha. s. coll., s.n. (holotype, NY!).

Young branchlets weakly to strongly hexangular, the angles ribbed and sometimes detaching with age, scattered to densely white villose or pilose, with simple trichomes; pseudostipules foliaceous, orbicular or elliptic, 3–25 × 3–17 mm, usually caducous. Leaves bifoliolate, occasionally with tendrils, tendrils trifid, tips filamentous; petiole 0.7–2 cm, pilose or villose; petiolule 0.5–3 cm, villose or pilose; leaflets ovate or elliptic, 2–8.5 × 1–6 cm, membranous, 3 or 4 pairs of lateral veins, tertiary veins reticulate, midrib and lateral veins flat or slightly impressed adaxially and prominent abaxially, adaxial surface drying brownish green, puberulent to pilose or trichomes restricted to main veins, densely pellucid-lepidote, abaxial surface drying brownish green, pilose to villose, trichomes dense to scattered, or trichomes restricted to main veins and lateral vein axils, densely pellucid-lepidote, usually with large glands scattered but especially dense in lower lateral vein axils, base obliquely obtuse or rounded, apex acute, often with apiculate tip. Inflorescence a panicle, peduncle with rachis 6–12.5 cm with 6 to 16 flowers, peduncle, rachis, and pedicels villose or pilose (rarely trichomes only at nodes), bracteoles unknown, early caducous; calyx 7–10 × 7–9 mm, coriaceous, with scattered appressed trichomes to densely tomentose, lepidote, usually with large external glands arranged in short broad glandular fields, apex denticulate; corolla magenta or lavender, weakly zygomorphic, gradually tubular-infundibular to tubular-campanulate from cylindric base, 4.5–8.8(rarely 10) cm, subcoriaceous to coriaceous, externally tomentose above glabrous base, tube 3.5–7.5 cm with cylindric base 8–20 mm and mouth 13–27 mm wide, internally with tufts of trichomes or minutely papillose at insertion of stamens, otherwise glabrous, lobes (rarely 10)15 22 × 18–22 mm, externally without glandular fields at base, internally lepidote or glabrous; stamens and staminode inserted 7–16 mm from base of corolla tube, shorter stamens with filaments 14–18 mm, included, longer stamens with filaments 21–25 mm, included, all anthers 4–5.5 mm, staminode 3–9 mm; disc 1.5–2 × 4–5 mm; pistil 3.2–3.8 cm, ovary ellipsoid or oblong, 4–5 × 2–3 mm, densely sericeous, style included, pilose at base to lower 3/4, stigma elliptic to ovate. Capsule elliptic, 8.5–10.5 × 2.7–3.5 cm, 1.5–2 cm in diam., base acute, apex acute to acuminate, valves convex, exocarp separating from adnate mesocarp and endocarp at maturity, minutely puberulent, tomentose or glabrous, surface with ± longitudinal wrinkles, midrib slightly raised apically or flat, wall 2–2.5 mm thick, endocarp densely scabrous. Seeds 1–1.8 × 2.5–3.5 cm, body glabrous or with a few minute trichomes, the wings well demarcated from the seed body, tan, membranous, hyaline.

Figure: Gentry (1982a: fig. 11, note illustration is inaccurate in portraying the inflorescence as a raceme).

Distribution. Specimens have been seen from native populations in Mexico: Chiapas, Oaxaca, Puebla, and Veracruz, and Nicaragua: Estelí and Madriz. Standley (1926) reported *Distictis laxiflora* as also found in Jalisco and Guanajuato, Mexico. No specimens from Jalisco were seen in this study, but it is possible that *Sheldon 52* from Guanajuato, which is cited below, is native. Found in rocky areas or deciduous forests, between 1100 and 2000 m elevation (Fig. 2A).

Phenology. Flowering March to August; fruiting January, May, July, October, and November.

Common names. Vanilla Distictis, Vanilla Trumpet Vine (Menninger et al., 1970); Jeroliz morado, Manto de la Virgen (Standley, 1926).

Uses. Cultivated in tropical and subtropical areas of the world for its beautiful flowers. Menninger et al. (1970) describe the buds as rich purple, the flowers turning lavender and then almost white with the tube streaked with lavender, with "all 3 colors displayed on the vine at the same time in perfect harmony" (Menninger et al., 1970: 108).

De Candolle (1845) published *Pithecoctenium cinereum* DC. with two syntypes, *M. Mairet de Chaudefont s.n.* (G-DC) and *G. Andrieux 221* (G-DC). The type material was examined, the more complete specimen (*M. Mairet de Chaudefont s.n.*, G-DC) selected as lectotype, and the name placed in synonymy of *Distictis laxiflora*. This synonymy follows that of Standley (1926) and Gentry (1974a, 1982a). The type of *P. cinereum* var. *parviflorum* Hochr. was studied and this name placed in synonymy of *D. laxiflora*.

Distictis laxiflora is the only species of *Distictis* known from Central America, and *D. laxiflora* and *D. buccinatoria* are the only species of *Distictis* found in Mexico. They have been hybridized to form the cultivar *Distictis* cv. 'Rivers,' marketed as "Distictis riversii" (see discussion below *D. buccinatoria*). It is not known if they hybridize naturally. The two can be difficult to distinguish when sterile or in flower, but the flowers of *D. buccinatoria* have orangish red corollas, which are usually larger (7.5–12 cm vs. 4.5–8.8 cm), and the longer pair of stamens exserted. The fruits of *D. buccinatoria* are also larger (13–15 × 4–5.5 cm vs. 8.5–10.5 × 2.7–3.5 cm), more oblong, with the apex acute and tip rounded and retuse, and the exocarp does not separate from the adnate mesocarp and endocarp at maturity. Vegetatively, *D. buccinatoria* tends to have larger and more persistent pseudostipules (5–35 × 5–28 mm vs. 3–25 × 3–17 mm), larger leaflets (5–10.5 × 3–6.1 cm vs. 2–8.5 × 1–6 cm) with the lateral veins more prominent abaxially, and trichomes with a golden cast.

Flowering and sterile collections of *Distictis laxiflora* are sometimes confused with *Pithecoctenium crucigerum*. The latter has more sharply angled branchlets, often additionally branched tendrils, the leaflets frequently larger (4.5–17 × 2.2–12 cm vs. 2–8.5 × 1–6 cm), the flowers white, usually strongly curved, and, in Central America, arranged in racemes (vs. panicles).

Distictis laxiflora has sometimes been confused in the horticultural trade with *D. lactiflora* (Menninger et al., 1970), but following Bailey et al. (1976), plants grown under the latter name are probably *D. laxiflora*. *Distictis lactiflora* differs from *D. laxiflora* in its leaflets that are subcoriaceous to coriaceous with very conspicuous, reticulate venation prominent on the adaxial surface, generally smaller (3–5.5 cm), lighter-colored flowers, lepidote (but usually otherwise glabrous) ovaries, and narrow elliptic to fusiform fruits with thin walls with the exocarp not separating from the adnate mesocarp and endocarp at maturity.

Mature fruits of *Distictis laxiflora* generally have both valves convex and the exocarp peeling away from the adnate mesocarp and endocarp; however, one specimen, *C. Conzatti & V. González 308* (TEX) had a curved fruit (one valve convex and the other concave) with an intact exocarp and was probably not fully developed.

Selected specimens examined. MEXICO. **Chiapas:** Amatenango del Valle, *A. S. Ton 2140* (F). **Guanajuato:** Silao, *D. H. Sheldon 52* (GH). **Oaxaca:** s. loc., *G. Andrieux 221* (syntype of *Pithecoctenium cinereum* DC., G-DC not seen, microfiche G-DC 9.195.10); Dtto. Etla, "Barranca Ceniza," al N-NO de El Parian, Mpio. San Jerónimo Sosola, *A. Salinas T. et al. 6888* (MO); Monte Alban, *C. G. Pringle 6724* (MO); Dtto. Teposcolula Mixteca Alta, Río del Oro, Tamazulapan, *A. García M. et al. 301* (MO). **Puebla:** vic. of San Luis Tultitlanapa, near Oaxaca, *C. A. Purpus 3261* (MO). **Veracruz:** Casa Amarilla, carretera las Trancas–Coatepec, Coatepec, *M. G. Zolá B. et al. 335* (MO). NICARAGUA. **Estelí:** Loma Ocotecalzado (Mesas Moropotente), ca. 11 km NE of Hwy. 1 at Estelí, *W. D. Stevens & A. Grijalva 15608*

(MO). **Madriz:** Cerro Quisuca, summit and upper slopes, *W. D. Stevens & P. P. Moreno 22199* (MO).

7. **Distictis occidentalis** A. H. Gentry, Novon 2: 161. 1992. TYPE: Colombia. Santander: 3 km N of Yarima on rd. to Albania SE of Barranca Bermeja, 25 July 1975, *A. H. Gentry & L. Forero 15409* (holotype, MO!; isotype, COL not seen).

Young branchlets sharply hexangular, the angles ribbed and detaching with age, with scattered to dense, golden to ferruginous, dendritic trichomes to 0.1 mm, some furfuraceous and without rachis, sometimes mixed with ones with rachis, the trichome arms usually numerous (rarely less than 4) and equal in length to the internodes; pseudostipules subfoliaceous, orbicular, ovate or broadly oblong, 2–4 × 1.5–4 mm, caducous. Leaves bifoliolate, often with tendrils, tendrils trifid, tips filamentous; petiole 1–4 cm, with trichomes like those of branchlet; petiolule 0.6–4 cm, with trichomes like those of branchlet; leaflets elliptic to oblong-obovate, 5–17.5 × 3–9 cm, membranous to chartaceous, 4 or 5 pairs of lateral veins, tertiary veins mostly parallel and ladder-like, rarely weakly reticulate, midrib and lateral veins flat adaxially and tertiary veins raised or all flat or midrib slightly impressed, midrib and lateral veins prominent abaxially with tertiary veins flat or prominent, adaxial surface usually drying reddish brown (rarely brownish green), usually with some trichomes on midrib (sometimes also on lateral and tertiary veins) furfuraceous-dendritic, scattered to densely lepidote, abaxial surface drying brownish green, with trichomes like those of branchlet usually on midrib and often on lateral veins, sometimes in lateral vein axils to dense over entire surface, then often mixed with trichomes to 0.15 mm with longer arms, densely pellucid-lepidote, occasionally with large glands, base obliquely rounded, or obtuse and then obliquely rounded or subcordate, apex obtuse with tip cuspidate and apiculate, or obtuse or rounded with tip apiculate, sometimes acuminate, the tip often curving. Inflorescence a raceme, peduncle with rachis 5–13 cm with 1 to 16 flowers, peduncle, rachis, and pedicels with trichomes like those of branchlet, bracteoles affixed at base of pedicel, oblong or narrow spatulate, 3–12 × 1.5–2 mm, usually persistent; calyx 5–7 × 5–9 mm, coriaceous, tomentose with furfuraceous-dendritic trichomes strongly appressed, external glandular fields short and broad, apex minutely denticulate (rarely truncate); corolla white with yellow throat, weakly zygomorphic, gradually tubular-infundibular or tubular-campanulate from cylindric base, (rarely 5.5)6.5–9.5 cm, subcoriaceous to membranous, externally with dense minute dendritic trichomes above glabrous base, tube (rarely 4.5)5–7.6 cm with cylindric base 12–24 mm and mouth 17–25 mm wide, internally villose at insertion of stamens, otherwise glabrous, lobes 10–30 × 15–30 mm, externally with linear glandular fields at base, internally with minute, scattered, dendritic trichomes and lepidote; stamens and staminode inserted 15–20 mm from base of corolla tube, shorter stamens with filaments 13–25 mm, included, longer stamens with filaments 22–32 mm, included, all anthers ca. 4 mm, staminode 5–14 mm; disc 1.5–2 × 4–5 mm; pistil 3.1–5 cm, ovary ellipsoid, 3–5 × 2.5–3 mm, densely tomentose with furfuraceous-dendritic trichomes, style included, with dendritic trichomes at base to lower 3/4, stigma orbicular to broadly elliptic. Capsule elliptic, ca. 10 cm, base acute and truncate, apex acuminate, exocarp not separating from the adnate mesocarp and endocarp at maturity, densely furfuraceous-dendritic appressed tomentose, lepidote, with numerous cup-shaped glands especially dense along midrib, wall ca. 2 mm thick. Seeds 12–13 × 15–16 cm, body glabrous, the wings poorly demarcated from the seed body, greatly reduced, brown, coriaceous, opaque.

Figure: Gentry (1992: fig. 1A, B).

Distribution. Northwestern South America from Chocó and Santander, Colombia, to Madre de Dios, Peru, and Santa Cruz, Bolivia. Usually found in seasonally inundated forests or along rivers, between 100 and 300 m elevation (Fig. 1B).

Phenology. Flowering April to July, October. Only one old fruit seen.

No reference to common name or economic use was found for this species.

No whole mature fruits of *Distictis occidentalis* were seen; the description here is based on the broken but apparently mature fruits of *S. F. Smith et al. 1455.*

Distictis occidentalis has seeds with the wings greatly reduced and coriaceous (vs. well developed and membranous-hyaline in most species of *Distictis*), and the body somewhat corky, suggesting that it is water dispersed (vs. wind dispersed), correlating well with its usual habitat of seasonally inundated forests or growth along rivers.

Distictis occidentalis is very similar to *D. granulosa,* and most collections were referred to that species prior to Gentry's 1992 publication of *D. occidentalis.* The two are similar in type and distribution of dendritic trichomes, the shape, size, and persistence of the pseudostipules, the leaflet size, shape, and ladder-like pattern of tertiary veins, the bracteole duration, overall flower size, calyx apex, and presence of corolla glandular fields. *Distictis occidentalis* differs from *D. granulosa* in the color of the corolla lobes (white vs. purple or lavender), leaflet texture (membranous to chartaceous vs. subcoriaceous to coriaceous) and lateral veins flat on upper surface versus impressed, shape of calyx glandular fields (short and broad vs. long and narrow), and the seed wings (very reduced, coriaceous-opaque vs. well developed, membranous-hyaline). The two species overlap at Tambopata, Peru, with *D. occidentalis* occurring in swampy areas around lake margins and *D. granulosa* occurring in sandy upland forests (Gentry, 1992).

The only other species of *Distictis* with dendritic trichomes, corolla glandular fields, and white corolla lobes is *D. steyermarkii.* The two species are also similar in pseudostipule persistence, leaflet texture and prominence of venation, and calyx glandular field shape. However, *D. steyermarkii* always has at least some simple trichomes on the leaflet adaxial surfaces and longer dendritic trichomes (0.3–2 mm vs. to 0.1 mm) on vegetative parts, caducous bracteoles, cordate leaflet bases, and well-developed, membranous-hyaline seed wings.

Gentry (1992) suggested two specimens from Peru, *T. B. Croat 18576* and *V. Huashikat 1912* (both in bud), might represent either a new species in *Distictis* or simply a more pubescent form of *D. occidentalis.* I believe that the latter is more likely the case, as *A. H. Gentry et al. 76577* helps to form a continuum between these densely pubescent specimens and the more glabrescent type. He also described the leaflet venation of *T. B. Croat 18576* as being intricately prominulous abaxially. However, many specimens of *D. occidentalis* (such as *O. Haught 2209*) are equally prominulous.

Selected specimens examined. BOLIVIA. **Santa Cruz:** Río Viboro, *F. Billiet & B. Jadin 5986* (BR). COLOMBIA. **Chocó:** Trail from Unguia to Cerro Mali, lowest slopes of Serrania del Darien, *A. H. Gentry & S. Mori 13737* (MO). **Santander:** Rd. from Barranca Bermeja to El Centro near airport, *A. H. Gentry & L. Forero 15398* (MO); vic. of Barranca Bermeja (El Centro), *O. Haught 2209* (MO). ECUADOR. **Sucumbíos:** Downstream Río Cuyabeno from Laguna de Cuyabeno to Puerto Bolivar, *J. Brandbyge et al. 30541* (MO, photocopy of AAU at MO). PERU. **Amazonas:** Valle del Río Santiago, ca. 65 km N de Pringlo, Quebrada Caterpiza, *V. Huashikat 1912* (MO). **Loreto:** 7 km SW of Iquitos, *T. B. Croat 18576* (MO); Quebrada Tamshiyacu, *A. H. Gentry et al. 76577* (MO). **Madre de Dios:** Tambopata Province, Cuzco Amazónico, *P. Núñez et al. 10919* (MO); edge of Laguna Cocacocha, Explorer's Inn, near confluence of Río Tambopata and Río La Torre, 39 km SW of Puerto Molodnado, *S. F. Smith et al. 1455* (MO).

8. Distictis pulverulenta (Sandwith) A. H. Gentry, Ann. Missouri Bot. Gard. 63: 77. 1976. *Distictella pulverulenta* Sandwith, Brittonia 3: 91. 1938. TYPE: Brazil. Amazonas: Basin of Rio Solimoes, Municipality of São Paulo de Olivença, basin of Creek Belem, Oct.–Dec. 1936, *B. A. Krukoff 8685* (holotype, NY not seen, digitized image!; isotypes, BM not seen, BR not seen, F not seen, GH not seen, K not seen, MO!, U not seen).

Young branchlets moderately to sharply hexangular, the angles ribbed (sometimes inconspicuously) and sometimes detaching with age, densely covered with minute, strongly appressed golden, simple trichomes; pseudostipules absent or rarely present, not foliaceous, oblong, ca. 3 × 1.5 mm, caducous. Leaves bifoliolate, occasionally with tendrils, tendrils trifid, tips sometimes disk-like; petiole 1.5–5.5 cm with minute strongly appressed trichomes; petiolule 0.7–2.4 cm with minute strongly appressed trichomes; leaflets elliptic, sometimes asymmetric, 5–14.5 × 3–10.4 cm, subcoriaceous to membranous, 3 to 5(rarely 6) pairs of lateral veins, tertiary veins weakly reticulate to loosely ladder-like, midrib and lateral veins impressed adaxially with tertiary veins prominent or flat or all nearly flat, midrib, lateral, and tertiary veins prominent abaxially or midrib and lateral veins prominent and tertiary veins flat, adaxial surface drying brownish or yellowish green, glabrous or minutely puberulent on main veins, abaxial surface drying greenish gray, usually densely furfuraceous-tomentose, ± canescent, with main veins glabrescent, occasionally surface glabrescent, conspicuous clusters of large glands present in the lower lateral vein axils, base rounded, subcordate, or obtuse, often obliquely, apex obtuse to acute with tip cuspidate. Inflorescence a panicle, peduncle with rachis 6–16 cm with numerous flowers, peduncle, rachis, and pedicels densely covered with minute appressed trichomes, bracteoles spatulate, ca. 10 × 3 mm, early caducous; calyx 9–15 × (rarely 6–)8–10 mm, coriaceous, pubescent with minute appressed trichomes, external glandular fields narrow and oblong to short and broad, apex truncate; corolla tube light purple, lobes dark red- or brown-purple, weakly zygomorphic, tubular-infundibular from cylindric base, (rarely 5)5.6–6.7 cm, membranous to subcoriaceous with base coriaceous, externally tomentose above glabrous base, tube (rarely 4)5–6 cm with cylindric base 8–12 mm and mouth 12–19 mm wide, internally tomentose and lepidote, villose along ridge of insertion of stamens, lobes 10–15 × 10–17 mm, externally without glandular fields at base, internally tomentose and lepidote; stamens and staminode inserted (rarely 8)10–11 mm from base of corolla tube, shorter stamens with filaments 15–19(rarely 21) mm, included, longer stamens with filaments 22–27 mm, included, all anthers 3.5–4 mm, staminode 3–6 mm; disc ca. 1 × 4 mm; pistil 4.2–4.8(rarely 5) cm, ovary ovoid or elliptic, 3–4.5 × 2–2.3 mm, densely covered with minute appressed trichomes, style included, tomentose to apex, stigma rhombic. Capsule elliptic, 7–13.5

× 3–3.6 cm, 0.8–1 cm in diam., base acute and truncate, apex acute, one valve convex and the other concave causing the fruit to be curved, exocarp not separating from the adnate mesocarp and endocarp at maturity, tomentose with minute trichomes, surface smooth, midrib slightly impressed, wall 1.5–2 mm thick. Seeds 1.3–1.8 × 5–7 cm, body glabrous or slightly papillose, the wings poorly demarcated from the seed body, yellowish apically to dark brown at base, membranous, hyaline apically to opaque at base.

Figure: Lohmann & Hopkins (1999: pp. 609, 619, 620).

Distribution. Northeastern Peru, Amazonian Brazil, southern Colombia (A. H. Gentry, pers. comm.), southern Venezuela, Guyana, Suriname (L. Lohmann, pers. comm.), and French Guiana. Found in non-inundated forests on white sand (Gentry, 1979a), frequently in disturbed areas, between 120 and 900 m elevation (Fig. 2A).

Phenology. Flowering January, May to July, November, and December; fruiting December.

No reference to common name or economic use was found for this species.

Distictis pulverulenta was described in the closely allied genus *Distictella* by Sandwith (1938), who emphasized its foliar pubescence and curved fruit in selecting generic placement. Gentry (1976) transferred *Distictella pulverulenta* to *Distictis* based on its hexangular, ribbed branchlets and straight, chartaceous to subcoriaceous, purple corollas all of which contrast with *Distictella*, which has terete branchlets and curved, coriaceous, white corollas. However, *Distictis pulverulenta* is an oddity in the genus *Distictis* based on several vegetative, floral, and fruiting characteristics that are common in *Distictella* but otherwise unknown in *Distictis*: the many-flowered, compoundly branched panicle, the pubescent and lepidote inner surface of the corolla tube, and the curved fruits. In addition, the seeds are very similar to those of *Distictella elongata*, with wings poorly demarcated from seed body, yellow and hyaline at the tips and brown and opaque at the base, with the same irregular ridges and papillae as found on the body. The generic placement of *Distictis pulverulenta* is uncertain, but, pending further study, it is here retained in *Distictis*, following Gentry (1976, 1982b).

Selected specimens examined. BRAZIL. **Amazonas:** Rio Tiqué, entre Fátima e Pari, *J. M. Pires & N. T. Silva 8002* (photocopy of IAN at MO); rd. to Praia Dourado after turnoff from paved rd., near Manaus, *A. H. Gentry & J. Ramos 13297* (MO). FRENCH GUIANA. St. Laurent piste d'Apatou, *C. Feuillet 1457* (MO). GUYANA. Akarai Mtns., height of land betw. drainage of Rio Mapuera (Trombetas tributary) and Shodikar Creek (Essequibo tributary), *A. C. Smith 2979* (MO). PERU. **Loreto:** Province Requena, Genaro Herrera, Río Ucayali below Requena, *A. H. Gentry et al. 21308* (MO); Maynas, Dtto. Iquitos, carretera de Peña Negra a 7 km de Quisto Cocha, *M. Rimachi Y. 5675* (MO); Maynas, Dtto. Iquitos, carretera de Peña Negra a 3 km de Quisto Cocha, *M. Rimachi Y. 7543* (MO). VENEZUELA. **Amazonas:** 4 km E of San Carlos de Río Negro, *R. Liesner 3648* (MO); carretera San Carlos–Solano, 2–6 km SO de Solano, *G. Morillo et al. 3972* (MO).

9. Distictis scabriuscula (Mart. ex DC.) A. H. Gentry, Ann. Missouri Bot. Gard. 61: 499. 1974. *Pithecoctenium scabriusculum* Mart. ex DC. in A. DC., Prodr. 9: 197. 1845. TYPE: Brazil. Rio Paraíba, 1826, *Prince Vidensis (Wied-Neuwied) s.n.* (holotype, BR "Herb. Martius"!)

Pithecoctenium scabriusculum var. *macranthum* Bureau & K. Schum. in Mart., Fl. Bras. 8(2): 171. 1896, var. "*macrantha.*" Syn. nov. TYPE: Brazil. With inaccurate locality information. (Bureau & K. Schumann, 1896), *A. Glaziou 7776* (holotype, P not seen; isotype, C!, photo F neg. 22129!).

Young branchlets sharply hexangular, the angles ribbed and detaching with age, with scattered to dense, golden to ferruginous, dendritic trichomes to 0.3 mm, some furfuraceous and without rachis mixed with ones with rachis, trichome arms numerous, the arms and internodes equally small; pseudostipules absent. Leaves bifoliolate, frequently with tendrils, tendrils trifid, tips filamentous; petiole 0.6–3 cm, with trichomes like those of branchlet, especially dense adaxially; petiolule 0.3–1.3 cm, with trichomes like those of branchlet, especially dense adaxially; leaflets elliptic, 4–10.2 × 2–6.2 cm, membranous to chartaceous, 3 or 4 pairs of lateral veins, tertiary veins mostly parallel and ladder-like, rarely weakly reticulate, veins all flat adaxially, or slightly impressed, prominent abaxially or with tertiary veins flat, adaxial surface drying reddish brown, with trichomes on midrib like those of branchlet or with scattered dendritic trichomes on surface, sometimes scattered lepidote, abaxial surface drying light brown-green, with trichomes like those of branchlet dense and covering entire surface, or only on the midrib, or trichomes with longer arms and internodes on surface with trichomes on midrib like those of branchlet, scattered pellucid-lepidote, occasionally with large glands, base obliquely obtuse to rounded (rarely subcordate), acute or obtuse with tip cuspidate and apiculate, often curving. Inflorescence a raceme, peduncle with rachis 1.5–4.5 cm with 1 to 4 flowers, peduncle, rachis, and pedicels with dense trichomes like those of branchlet, bracteoles affixed at base of pedicel, linear or awl-like, 6–11 × 0.5–1 mm, caducous; calyx 1.5–7(rarely 9) × 6–7 mm, subcoriaceous, tomentose with dense trichomes like those of branchlet, external glandular fields narrow and oblong, apex denticulate; corolla with tube yellow and lobes purple to purple-red, weakly zygomorphic, gradually tubular-infundibular or tubular-campanulate from cylindric base, 5.5–6.5 cm, subcoriaceous to membranous, externally with dense minute dendritic trichomes above glabrous base, tube 4.2–4.8 cm with cylindric base 9–10 mm and mouth 13–15 mm wide, internally villose at insertion of stamens, otherwise glabrous, lobes 10–17 × 14–15 mm, externally with linear glandular fields at base or glands somewhat scattered, internally lepidote with few dendritic trichomes; stamens and staminode inserted 11–15 mm from base of corolla tube, shorter stamens with filaments 13–18 mm, included, longer stamens with filaments 19–22(rarely 24) mm, included, all anthers 3.5–4.2 mm, staminode 4–5 mm; disc ca. 2 × 5 mm; pistil 3.2–4 cm, ovary ovoid, ca. 5 × 3.5 mm, densely tomentose with dendritic trichomes like those of branchlet, style included, with dendritic trichomes at base to lower 3/4, stigma obovate. Capsule broadly elliptic, ca. 4 × 2.8 cm, ca. 0.3 cm in diam., base acute and truncate, apex acute and apiculate, valves compressed, exocarp not separating from the adnate mesocarp and endocarp at maturity, tomentose with dense dendritic trichomes, glands numerous, especially apically, midrib flat, wall ca. 1 mm thick. Seeds ca. 17 mm, body puberulent, the wings well demarcated from the seed body, tawny, membranous, hyaline.

No figures found in the literature for this species.

Distribution. Central-eastern Brazil, from Pernambuco to Espírito Santo and west to Serra do Espinhaço of Minas Gerais. Growing in disturbed areas at 950 m (only one collection seen with elevation indicated; Fig. 2B).

Phenology. Flowering February and March. Fruiting February.

No reference to common name or economic use was found for this species.

Type material of *Pithecoctenium scabriusculum* var. *macranthum* Bureau & K. Schum. was studied and not found to be distinct enough from typical material of *P. scabriusculum* Mart. ex DC. to warrant varietal recognition, and this name is placed in synonymy of *Distictis scabriuscula*.

Only one fruit of *Distictis scabriuscula* was seen, and it had retained only one seed with wings torn.

Distictis scabriuscula is similar to *D. frutescens* and *D. granulosa* in having purple corolla lobes, glandular fields on the corollas, and dendritic trichomes. It differs from *D. frutescens* primarily in the absence of pseudostipules, which are large, foliaceous, and persistent in *D. frutescens*, and in having bracteoles caducous (vs. persistent) and narrower (6–11 × 0.5–1 mm vs. 13–22 × 2–8 mm). In addition, the calyx denticules of *D. frutescens* are somewhat more distinct than those of *D. scabriuscula* and the calyx glandular fields somewhat broader. *Distictis scabriuscula* differs from *D. granulosa* in having leaflets membranous to chartaceous versus coriaceous, elliptic versus often obovate and smaller (4–10.2 × 2–6.2 cm vs. 7–19 × 3.5–10.5 cm) with the midrib and lateral veins flat adaxially. The bracteoles of *D. scabriuscula* are caducous and longer and relatively narrower than those of *D. granulosa* (1.5–2 × 1 mm), and the trichomes are larger (to 0.3 mm vs. to 0.15 mm).

Gentry (1974a) placed *Distictis scabriuscula* closest to *D. steyermarkii*. While most collections of *D. steyermarkii* have longer trichomes (0.7–2 mm) with fewer and longer arms, a few specimens have the longest trichomes only 0.3 mm long with numerous, small arms and very small internodes, and are indistinguishable from the longer trichomes of *D. scabriuscula*. However, there are always at least a few simple trichomes on the adaxial surfaces of the leaflets of *D. steyermarkii* (not found in *D. scabriuscula*), and *D. scabriuscula* has some furfuraceous-dendritic trichomes on its vegetative parts, which are absent on vegetative parts of *D. steyermarkii*. In addition, *D. steyermarkii* has subfoliaceous pseudostipules (3–8 × 1.5–5 mm), cordate leaflet bases, calyces with the trichomes minute and strongly appressed and with short and broad glandular fields, and white corolla lobes, while *D. scabriuscula* has the pseudostipules absent, leaflet bases obliquely obtuse to rounded (rarely subcordate), calyces with trichomes longer and spreading and narrow and oblong glandular fields, and purple to purple-red corolla lobes.

Selected specimens examined. BRAZIL. **Bahia:** Rodovia, BR 5, 16 km S of Euriápolis, *R. P. Belém & R. S. Pinheiro 2676* (MO). **Espírito Santo:** Santa Teresa, *W. Boone 8* (MO). **Minas Gerais:** Serra do Espinhaço, SE drainage of Pico de Itambé, about 5 km NW of Santo Antônio de Itambé, *W. R. Anderson et al. 35669* (MO, NY). **Pernambuco:** Paulista, Km 14 da BR 101 ao lado do Posto Esso, *E. Tenório 66/158* (INPA photocopy at MO).

10. **Distictis staminea** (Lam.) A. H. Gentry, Ann. Missouri Bot. Gard. 61: 497. 1974. *Bignonia staminea* Lam., Encycl. 1: 421. 1785. *Wunschmannia staminea* (Lam.) Urb., Symb. Antill. 5: 494. 1908. TYPE: Dominican Republic. Santo Domingo, t. 56, f. 2, Plum. in Burm., Pl. Amer. 1756 (lectotype, designated by de Candolle, 1845: 161, tab. 56, f. 2, Burm., 1756!; original Plumier drawing, P not seen).

Young branchlets sharply hexangular, the angles ribbed and sometimes detaching with age, densely puberulent with simple trichomes; pseudostipules subfoliaceous, elliptic, ca. 5 × 2 mm, early caducous. Leaves bifoliolate, sometimes with tendrils, tendrils trifid, tips sometimes disk-like; petiole 0.6–3 cm, puberulent or pilose adaxially; petiolule 0.4–1.5 cm, puberulent or pilose adaxially; leaflets oblong or ovate, 2.4–6 × 1.1–4 cm, subcoriaceous, 3 or 4 pairs of lateral veins, tertiary veins reticulate, midrib, lateral, and tertiary veins conspicuously prominent adaxially, midrib and lateral veins prominent abaxially, drying dark brown-green, adaxial surface minutely puberulent along veins, densely pellucid-lepidote, abaxial surface pilose along main veins, densely pellucid-lepidote, sometimes with large glands scattered near base, base obliquely truncate, apex acute or obtuse with tip retuse. Inflorescence a raceme or racemose panicle, peduncle with rachis 10–20 cm with 4 to 14 flowers, peduncle, rachis, and pedicels puberulent and lepidote, bracteole affixed at base of pedicel, linear, ca. 3 × 0.5 mm, early caducous; calyx 5–8 × 6–8 mm, subcoriaceous, lepidote and with scattered, small trichomes, external glandular fields poorly defined, apex denticulate; corolla orangish yellow to reddish orange, strongly bilabiate with the lower lip reflexed with 3 equal lobes and the upper lip erect and bilobate, narrowly tubular-infundibular from cylindric base, 5.2–6 cm, chartaceous, externally tomentose and lepidote above glabrous base, tube 4–4.5 cm with cylindric base 7–12 mm and mouth 9–11 mm wide, internally villose at insertion of stamens, otherwise glabrous, lower lobes ca. 10 × 8 mm and upper lip ca. 10 × 9 mm, externally without glandular fields at base, internally tomentose and lepidote; stamens and staminode inserted 10–13 mm from base of corolla tube, shorter stamens with filaments ca. 35 mm, included, longer stamens with filaments 39–45 mm, exserted beyond mouth of corolla tube by 10–12 mm, all anthers ca. 4 mm, staminode 8–10 mm; disc 2–3 × 4 mm; pistil longer than 5.5 cm, ovary ovoid or oblong, ca. 4 × 2.5 mm, densely lepidote with scattered trichomes at base, style exserted, glabrous, stigma oblong. Capsule oval.

Figure: Burman (1756: t. 56, f. 2).

Distribution. Endemic to Hispaniola. Growing in semi-arid forest, between 80 and 500 m elevation (Fig. 1A).

Phenology. Flowering January, March, and May; fruiting material not seen.

No reference to common name or economic use was found for this species.

Lamarck's original description (1783) was based on Plumier drawing "5" and the reproduction of the Plumier plate in Burman (1756: t. 56, f. 2), the latter selected by de Candolle (1845) as the lectotype. The plate in Burman (1756), cited by de Candolle (1845), is odd in having simple tendrils from the leaf nodes and compound leaves that terminate in a flower. Following Gentry (1974a) and Urban (1908), these errors are not present in the original Plumier plate at P.

Much of the above description is from Urban (1908) and Liogier (1995b).

Distictis staminea is unique in the genus *Distictis* in having a strongly bilabiate corolla. The corolla of *D. staminea*, which is narrow, orange, with erect bilobed upper lip and spreading 3-lobed lower lip, is reminiscent of the corolla of the monotypic genus *Dolichandra* Cham. of southern South America. The latter differs in its spathaceous calyx and claw-like tendrils. Both are apparently hummingbird pollinated. *Distictis staminea* is similar vegetatively to *D. lactiflora*, the latter differing in the glabrous undersurface of the leaflets, its white, slightly zygomorphic corollas, and included stamens.

Specimens examined. HAITI. Gonaïves ad Grande, *W. Buch 352* (MO); vic. of Port de Paix, *E. C. Leonard & G. M. Leonard 12329* (K not seen, photocopy at MO).

11. **Distictis steyermarkii** A. H. Gentry, Ann. Missouri Bot. Gard. 61: 499. 1974. TYPE: Venezuela. Distrito Federal: betw. Osma and Todasana, 100 m, 24 Nov. 1971, *J. A. Steyermark & C. B. Carias 105274* (holotype, MO!; isotype, VEN not seen).

Young branchlets sharply hexangular, the angles ribbed and detaching, pubescent with scattered to dense, yellow dendritic and/or simple trichomes, longest trichomes (rarely 0.3–)0.7–2 mm, all the dendritic trichomes with rachis, usually with 2 to 4 arms and internodes usually long, rarely with numerous arms, and arms and internodes short; pseudostipules subfoliaceous, lanceolate, 3–8 × 1.5–5 mm, caducous. Leaves bifoliolate, often with tendrils, tendrils trifid, tips filamentous; petiole 1–4.5 cm, with trichomes like those of branchlet; petiolule 0.6–2.5 cm, with trichomes like those of branchlet; leaflets ovate or oblong, 4–15 × 2.5–9 cm, membranous or chartaceous, 3 or 4 pairs of lateral veins, tertiary veins mostly weakly reticulate, rarely ± parallel and ladder-like, midrib and lateral veins flat or impressed adaxially and tertiary veins raised or flat, midrib, lateral, and tertiary veins prominent abaxially, usually drying olive or yellowish green, adaxial surface with scattered simple trichomes (rarely 0.1–)0.7–2 mm, often mixed with dendritic trichomes, usually with 2 to 4 arms (rarely numerous arms), scattered to densely lepidote, abaxial surface with dendritic trichomes, the longest (0.3–)0.7–1 mm with 2 to 4 arms, rarely only to 0.15 mm and with numerous small, closely compressed arms, sometimes mixed with simple trichomes, densely pellucid-lepidote, occasionally with large glands, base obliquely or symmetrically cordate (rarely subcordate), apex obtuse with tip cuspidate. Inflorescence a raceme, peduncle with rachis 3–11 cm with 4 to 10 flowers, peduncle, rachis, and pedicels pubescent with trichomes furfuraceous-dendritic (rarely some of the trichomes dendritic with rachis), bracteoles affixed at base of pedicel, linear, 3–10 × 0.7–2 mm, caducous; calyx 4–8 × 6–8 mm, coriaceous, tomentose with furfuraceous-dendritic trichomes strongly appressed, external glandular fields short and broad, apex truncate (rarely minutely denticulate); corolla white with yellow throat, weakly zygomorphic, gradually tubular-campanulate from cylindric base, 5.8–7.5 cm, membranous, externally with dense minute dendritic trichomes above glabrous base, tube 4.3–6 cm with cylindric base 10–15 mm and mouth 10–22 mm wide, internally villose at insertion of stamens, otherwise glabrous or lepidote, lobes 10–20 × 11–20 mm, externally with linear-glandular fields at base, internally with scattered minute dendritic trichomes and lepidote; stamens and staminode inserted 10–14 mm from base of corolla tube, shorter stamens with filaments 17–20 mm, included, longer stamens with filaments 23–29 mm, included, all anthers 4–5 mm, staminode 5–6 mm; disc ca. 1 × 2–3 mm; pistil 3.5–4.9 cm, ovary ellipsoid, 3–5 × ca. 2 mm, densely tomentose with furfuraceous-dendritic trichomes, style included, with dendritic trichomes nearly to apex, stigma broadly elliptic. Capsule elliptic, 7.5–11 × 2.2–3.5 cm, ca. 1.5 cm in diam., base acute and truncate, apex acute, both valves convex, exocarp not separating from the adnate mesocarp and endocarp at maturity, tomentose with minute dendritic trichomes, numerous cup-shaped glands especially dense along midrib, midrib slightly impressed, wall ca. 1–2 mm thick. Seeds 1–1.5 × 3–3.9 cm, body minutely puberulous, the wings well demarcated from the seed body, pale brown, membranous-hyaline.

Figure: Gentry (1982b: fig. 16).

Distribution. Northwestern Venezuela, from Miranda to Zulia and Táchira and adjacent Colombia: Cesar and Norte de Santander (A. H. Gentry, pers. comm.). Found in deciduous forests and disturbed areas, between sea level and 1400 m elevation (Fig. 2A).

Phenology. Flowering August, October, November, February, and March; fruiting November.

No reference to common name or economic use was found for this species.

Distictis steyermarkii differs from the other species of *Distictis* with dendroid trichomes and corolla glandular fields in having at least some simple trichomes present on the adaxial leaf surface, and the trichomes, especially those of petiole and petiolule, are usually long (rarely 0.3–)0.7–2 mm. It is most similar to *D. occidentalis* by virtue of having pseudostipules similar in size and persistence, leaflet texture membranous to chartaceous, calyx glandular field short and broad, and corollas white with yellow throats. However, the two differ not only in form and length of vegetative trichomes (to 0.15 mm in *D. occidentalis*) but also in the bracteoles, which are generally persistent in *D. occidentalis*, leaflet bases, which vary from obliquely rounded to subcordate in *D. occidentalis*, and seed wings, which are greatly reduced, coriaceous, and opaque in *D. occidentalis*.

Gentry (1974a) placed *Distictis steyermarkii* closest to *D. scabriuscula*, which differs in having furfuraceous-dendritic trichomes on the branchlets, petioles, petiolules, and inflorescence (vs. dendritic trichomes with rachis and simple trichomes), pseudostipules absent (vs. present, but caducous), leaflets without simple trichomes (vs. present on adaxial surfaces), with bases usually obliquely obtuse to rounded (vs. usually cordate), calyx glandular fields narrow and oblong (vs. short and broad), and corolla lobes purple to purple-red (vs. white).

Selected specimens examined. COLOMBIA. **Cesar:** Rincon Hondo, Magdalena Valley, *C. Allen 424* (MO). VENEZUELA. **Distrito Federal:** Dept. Vargas, 0.6 km W of Oritapo, 7 km E of Osma, *J. A. Steyermark & V. Carreño Espinoza 106874* (MO); E of Los Caracas, vic. of Osma, *A. H. Gentry & P. Berry 14758* (MO). **Miranda:** 36 km W of Boca de Uchire, *A. H. Gentry et al. 10375* (MO). **Táchira:** Pan-American Hwy., 12 km NE of La Fria, *A. H. Gentry et al. 11049* (MO). **Zulia:** Dept. Colón, alrededores de Casigua El Cubo, sector Las Cruces, 1–2 km al S de Casigua rumbo a El Carmelo, *G. S. Bunting & F. Arboleda L. 8071* (MO); Dept. Colón, carretera Casigua–Palmira–Encontrados, entre Casigua y km 15 de la vía, *G. S. Bunting & M. Fucci 9831* (MO).

Literature Cited

Aublet, J. B. C. F. 1775. Histoire des Plantes de la Guiane François. Londres, Paris.

Bailey, L. H., et al. 1976. Hortus Third. A Concise Dictionary of Plants Cultivated in the United States and Canada. Macmillan General Reference, New York.

Baillon, H. E. 1891 [1888]. Histoire des Plantes. Bignoniacées, Vol. 10: 1–78. L. Hachette et Cie, Paris.

Bello y Espinosa, D. 1881. Apuntes para la flora de Puerto-Rico. Anales Soc. Esp. Hist. Nat. 10: 233–304.

Bentham, G. 1876. Bignoniaceae. Pp. 1026–1053 *in* G. Bentham & J. D. Hooker (editors), Genera Plantarum, Vol. 2(2). Lovell Reeve & Co., Williams & Norgate, London.

Borhidi, A. & O. Muñiz. 1971. Combinationes novae florae Cubanae. I. Bot. Közlem. 58: 175–177.

Brawer, M. 1991. Atlas of South America. The MacMillan Press Ltd., London and Basingstoke.

Britton, N. L. 1925. Bignoniaceae. Sci. Surv. Porto Rico & Virgin Islands 6: 191–201.

Bureau, É. 1864. Monographie des Bignoniacées. J.-B. Baillière et Fils, Paris.

———. 1911. Bignoniaceae. Flora Portoricensis. Pp. 562–568 *in* I. Urban (editor), Symbolae Antillanae. Vol. 4. Fratres Borntraeger, Lipsiae; Paul Klincksieck, Parisiis; Williams & Norgate, Londini.

——— & K. Schumann. 1896. Bignoniaceae. i. Pp. 1–230 *in* C. F. P. von Martius (editor), Flora Brasiliensis, Vol. 8(2, fasc. 118). Lipsiae apud Fried. Fleischer in Comm., Munich.

Burman, J. 1755–1760. Plantarum Americanarum fasciculus primus [-decimus]. S. Schouten & Lugd. Batav. apud Gerard. Potvliet & Theodor. Haak., Leiden.

Candolle, A. P. de. 1845. Bignoniaceae. Pp. 142–248 *in* A. L. P. P. de Candolle (editor), Prodromus, Vol. 9. Sumptius Victoris Masson, Paris.

Elias, T. S. & H. Gelband. 1975. Nectar: Its production and functions in Trumpet Creeper. Science 189: 289–291.

Gentry, A. H. 1973. Generic delimitations of Central American Bignoniaceae. Brittonia 25: 226–242.

———. 1974a. Studies of Bignoniaceae 11: A synopsis of the genus *Distictis*. Ann. Missouri Bot. Gard. 61: 494–501.

———. 1974b. Coevolutionary patterns in Central American Bignoniaceae. Ann. Missouri Bot. Gard. 61: 728–759.

———. 1975. Identification of Vellozo's Bignoniaceae. Taxon 24: 337–344.

———. 1976. Studies in Bignoniaceae 19: Generic mergers and new species of South American Bignoniaceae. Ann. Missouri Bot. Gard. 63: 46–80.

———. 1979a. Distribution patterns of Neotropical Bignoniaceae: Some phytogeographic implications. Pp. 339–354 *in* K. Larsen & L. B. Holm-Nielsen (editors), Tropical Botany. Academic Press, London, New York, San Francisco.

——. 1979b [1980]. Additional generic mergers in Bignoniaceae. Ann. Missouri Bot. Gard. 66: 778–787.

———. 1980. Bignoniaceae–Part I. Fl. Neotrop. Monogr. 25(1): 1–130.

———. 1982a. Bignoniaceae. Flora de Veracruz 24. Instituto Nacional de Investigaciones sobre Recursos Bióticos, Xalapa.

———. 1982b. Bignoniaceae. Flora de Venezuela 8(1). Fundación de Educación Ambiental, Caracas.

———. 1983. Dispersal and distribution in Bignoniaceae. Sonderb. Naturwiss. Vereins Hamburg 7: 187–199.

———. 1990. Evolutionary patterns in Neotropical Bignoniaceae. Mem. New York Bot. Gard. 55: 118–129.

———. 1992. Six new species of Bignoniaceae from upper Amazonia. Novon 2: 159–166.

——— & A. S. Tomb. 1979 [1980]. Taxonomic implications of Bignoniaceae palynology. Ann. Missouri Bot. Gard. 66: 756–777.

Glaziou, A. F. M. 1911. Plantae Brasiliae centralis a Glaziou lectae. Bull. Soc. Bot. France 58(Mém. 3f): 1–659.

Gomes, J. C., Jr. 1952 [1953]. Bignoniaceae do ex-herbário Heringer. Arch. Jard. Bot Rio de Janeiro 12: 147–166, plates 1–6.

Greenman, J. M. 1898. Diagnoses of new and critical Mexican phanerogams. Proc. Amer. Acad. Arts 33: 471–489.

Jacquin, M. 1797. Plantarum rariorum horti caesarei schoenbrunnensis, Vol. 2. C. F. Wappler, Viennae; B. & J. White, Londini; S. & J. Luchtmans, Lugduni Batvorum.

Kränzlin, F. 1921. Bignoniaceae novae. III. Repert. Spec. Nov. Regni Veg. 17: 115–125.

Lamarck, J. B. A. P. Monnet de. 1783 [1785]. Bignone. Pp. 417–426 *in* Encyclopédie Méthodique, Vol. 1. Chez Panckoucke, Paris.

Lindley, J. 1830. Bignónia Cherére, the Cherere *Bignonia*. Edwards's Bot. Reg. 15: t. 1301.

Liogier, H. A. 1957. Bignoniaceae. Pp. 414–446 *in* J. S. Sauget & H. A. Liogier (editors), Flora de Cuba, Vol. 4. Contribuciones Ocasionales del Museo de Historia Natural del Colegio "De La Salle," Vedado, La Habana.

———. 1995a. Descriptive Flora of Puerto Rico and Adjacent Islands. Spermatophyta–Dicotyledoneae. 4. Editorial de la Universidad de Puerto Rico, Río Piedras.

——. 1995b. La Flora de la Española. 7. Universidad Central del Este, San Pedro de Macorís.

Lohmann, L. G. & M. J. G. Hopkins. 1999. Bignoniaceae. Pp. 608–623 *in* J. E. L. da S. Ribeiro, et al. Flora da Reserva Ducke: Guia de Identificação das Plantas Vasculares de Uma Floresta de Terra-Firme na Amazônia Central. INPA-DFID, Manuas.

McNeill, J., F. R. Barrie, H. M. Burdet, V. Demoulin, D. L. Hawksworth, K. Marhold, D. H. Nicolson, J. Prado, P. C. Silva, J. E. Skog, J. H. Wiersema & N. J. Turland (editors). 2006. International Code of Botanical Nomenclature (Vienna Code). Regnum Veg. 146.

Meisner, C. F. 1840. Plantarum Vascularium Genera. 9(1-Tab. Diagn.): 285–312, 9(2-Commentarius): 193–224. Libraria Weidmannia, Leipzig.

Melchior, H. 1927. Der natürliche Formenkreis der *Pithecocteniinae* innerhalb der Familie der Bignoniaceae. Repert. Spec. Nov. Regni Veg. Beih. 46: 71–82.

Menninger, E. A., et al. 1970. Flowering Vines of the World. Hearthside Press Incorporated, New York.

Miers, J. 1863. Report on the plants collected by Mr. Weir, especially the Bignoniaceae. Proc. Roy. Hort. Soc. London 3: 179–202.

Pichon, M. 1945 [1946]. Notes sur les Bignoniacées. Bull. Soc. Bot. France 92: 222–229.

Rafinesque, C. S. 1838. Sylva Tellurina. Rafinesque, Philadelphia.

Sampaio, A. J. de. 1935. Novas especies de Bignoniaceas. Ann. Acad. Brasil. Sci. 7: 111–127.

Sandwith, N. Y. 1938. Three new South American plants. Brittonia 3(1): 91–94.

———. 1955. Nomina generica conservanda proposita. Taxon 4: 43–47.

———. 1962. Contributions to the flora of tropical America: LXVII. Notes on Bignoniaceae: XXV. Proposed lectotypes of certain genera. Kew Bull. 15: 453–457.

———. 1965. Contribution to the flora of tropical America: LXXII. Notes on Bignoniaceae: XXVIII. The identity of *Anemopaegma nigrescens*. Kew Bull. 19: 409–414.

Santos, G. dos. 1995. Wood Anatomy, Chloroplast DNA, and Flavonoids of the Tribe Bignonieae (Bignoniaceae). Ph.D. thesis. The University of Reading, United Kingdom.

Schumann, K. 1894–1895. Bignoniaceae. Pp. 189–252 *in* A. Engler (editor), Die naturlichen Pflanzenfamilien. Vol. 4(3b). Wilhelm Engelmann, Leipzig.

Sprague, T. A. & N. Y. Sandwith. 1932a. Contributions to the flora of tropical America IX: The Tabebuias of British Guiana and Trinidad. Bull. Misc. Inform. Kew 1932: 18–28.

——— & ———. 1932b. Contributions to the flora of tropical America X: New and noteworthy Bignoniaceae from British Guiana, mainly collected by the Oxford University Expedition, 1929. Bull. Misc. Inform. Kew 1932: 81–93.

Stafleu, F. A. & R. S. Cowan. 1985. Taxonomic Literature, 2nd ed., Vol. 5. Bohn, Scheltema & Holkema, Utrecht./ Antwerpen dr. W. Junk b.v., Publishers, The Hague/ Boston.

Standley, P. C. 1926. Trees and shrubs of Mexico (Bignoniaceae–Asteraceae). Contr. U.S. Natl. Herb. 23(5): 1313–1721.

Urban, I. 1908. VIII. Nova genera et species III (cont.). Symbolae Antillanae 5(3): 353–531. Fratres Borntraeger, Lipsiae; Paul Klincksieck, Parisiis; Williams & Norgate, Londini.

———. 1916a. Bignoniaceae trinitensis, nonullis aliis antillanis novis adjectis. Repert. Spec. Nov. Regni Veg. 14: 300–314.

———. 1916b. Über Ranken und Pollen der Bignoniaceen. Ber. Deutsch. Bot. Ges. 34: 728–758, pl. 21.

———. 1924. III. Plantae Cubenses novae vel rariores a clo. Er. L. Ekman lectae-II. Symbolae Antillanae 9(2): 177–272. Fratres Borntraeger, Lipsiae; Paul Klincksieck, Parisiis; Williams & Norgate, Londini.

Vahl, M. 1794. Symbolae Botanicae, Vol. 3. Impensis auctoris. Excudebant Nicolaus Möller et filius,. . . Hauniae [København].

APPENDIX 1. Index to Exsiccatae.

Collections are alphabetical by collector name. After the collector's number, the number in parentheses corresponds to the species number in the List of Species. Type collections appear in boldface. All collections cited here were examined by this author as part of this study.

LIST OF SPECIES

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3. *Distictis gnaphalantha* (A. Rich.) Greenm.
4. *Distictis granulosa* Bureau & K. Schum.
5. *Distictis lactiflora* (Vahl) DC.
6. *Distictis laxiflora* (DC.) Greenm.
7. *Distictis occidentalis* A. H. Gentry
8. *Distictis pulverulenta* (Sandwith) A. H. Gentry
9. *Distictis scabriuscula* (Mart. ex DC.) A. H. Gentry
10. *Distictis staminea* (Lam.) A. H. Gentry
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